MIDSUMMER VASCULAR PLANTS OF SOUTHEASTERN VIRGINIA

M. L. Fernald

(*Continued from page 413*)

Salix sericea Marsh. Wet peaty clearings in woods of *Pinus serotina*, south of Grassfield, no. 3887.

It is most surprising to find this essentially northern and continental species growing in typical wet pine barren, with characteristic austral plants such as the *Myrica* next noted. *S. sericea*, as previously represented in the Gray Herbarium from Virginia, has come from the piedmont and mountains only.

Myrica Curtissi Chevalier, var. media (Michx.) Cheval. Mon. Myric. 186 [270] (1901). Wet peaty clearings in woods of *Pinus serotina*, south of Grassfield, no. 3890 (small-leaved form).

This is the first record of any form of *Myrica Curtissi* from north of South Carolina; but several specimens from southern New Jersey belong to var. *media*. We have three species of Wax Myrtle or Candle Berry north of Florida. *M. cerifera* L. (including true *M. caroliniensis* Mill., not recent authors) is either a shrub or tree with the coriaceous and evergreen narrowly oblanceolate leaves varying from entire to sharply serrate, and with the smallest fruit of our three species. *M. Curtissi* Cheval. is also evergreen, with coriaceous lustrous foliage oblong to narrowly obovate. The typical form of the species has glabrous foliage and branches, but var. *media* has the expanding leaves strongly pubescent, the mature leaves more or less velutinous and the dark (blackish) bark of the branches permanently somewhat pubescent. Its fruits are described as slightly larger than in *M. cerifera*. The third species is the deciduous-leaved shrub or small tree of the Atlantic slope: leaves oblong to narrowly obovate, submembranaceous, opaque; bark of mature branches whitish-gray and glabrous; fruits 3.5–4.5 mm. in diameter. This shrub, extending north to southern Newfoundland and the Magdalen Islands, is erroneously passing as *M. caroliniensis* Mill. Miller clearly described the variation of *M. cerifera* with most serrate leaves and cited for it a characteristic plate of Catesby. The wrong interpretation of *M. caroliniensis* is clearly discussed by Chevalier, who correctly takes up for the deciduous-leaved and northern species the name *M. pensilvanica* Loiseleur. Loiseleur gave a beautiful characterization of the northern Bayberry and an excellent plate. The name *M. pensilvanica* had formerly crept into horticultural lists but its first clear definition seems to have been that of Loiseleur.

Typical glabrous MYRICA CURTISSI was extended northward into Virginia in May, 1935: pine woods near Benefit, *Fernald & Griscom*, no. 4380.

CARPINUS CAROLINIANA Walt. Common in swampy woods or occasionally in dry woods: Blackwater River, no. 3894; west of Pungo, *F. & G.*, no. 4382.

Carpinus caroliniana (PLATE 394) in the swamps and wet woods of southeastern Virginia looked strange to our northern eyes. Its slender trunks were covered with ashy-gray bark, instead of the steel-blue or blue-gray cortex which in the North gives the tree the name "Blue Beech." The leaves, too, looked unfamiliar, small and oblong, with very short teeth, suggesting, very superficially, those of *Amelanchier oblongifolia*. Study in the herbarium shows, indeed, that all the material from the southern coastal plain, from Florida to eastern Texas, thence north into southernmost Illinois and to eastern Virginia, the leaves of the fruiting branches are oblong to narrowly oblong-ovate, 1–3.5 (very rarely –4) cm. broad, 2.5–8 cm. long, acute (but not subcaudate) at tip, with comparatively low serration (FIGS. 6–10), the small teeth rarely 1 mm. long. The bracts (FIGS. 2–5) of the fruiting ament are obtuse or subacute, the few teeth blunt or at least not sharp-pointed. The calyx-lobes (FIGS. 2–5) at summit of the fruit are usually well developed, sometimes quite conspicuous (especially FIG. 2).

The tree of the North (PLATE 395), from Nova Scotia to Ontario and Minnesota, south through the northern states and in the uplands to North Carolina and Arkansas, has bluer bark; it also has larger and more oval leaves with a caudate-acuminate tip, with sharper and longer teeth (FIGS. 5–7), mostly sharper-toothed bracts (FIGS. 2–4) and usually very reduced calyx-lobes. That the small-leaved extreme of the southern Coastal Plain is what Walter must have had when he gave his brief diagnosis of *Carpinus caroliniana* in his Flora Caroliniana, written at Santee, South Carolina, there is scarcely a doubt. It, therefore, becomes necessary to find the proper name for the wider-ranging northern and inland tree. It is reasonably certain that it must be *Carpinus Betulus virginiana* Marshall, Arb. Amer. 25 (1785), for Marshall must have had the northern variety; and his characterization of the "oval, pointed leaves, sawed on the edges" is sufficiently definite. Since there is variation in all the characters I feel that the two trees are geographic varieties rather than distinct species. I, therefore, propose to call the larger-leaved variety

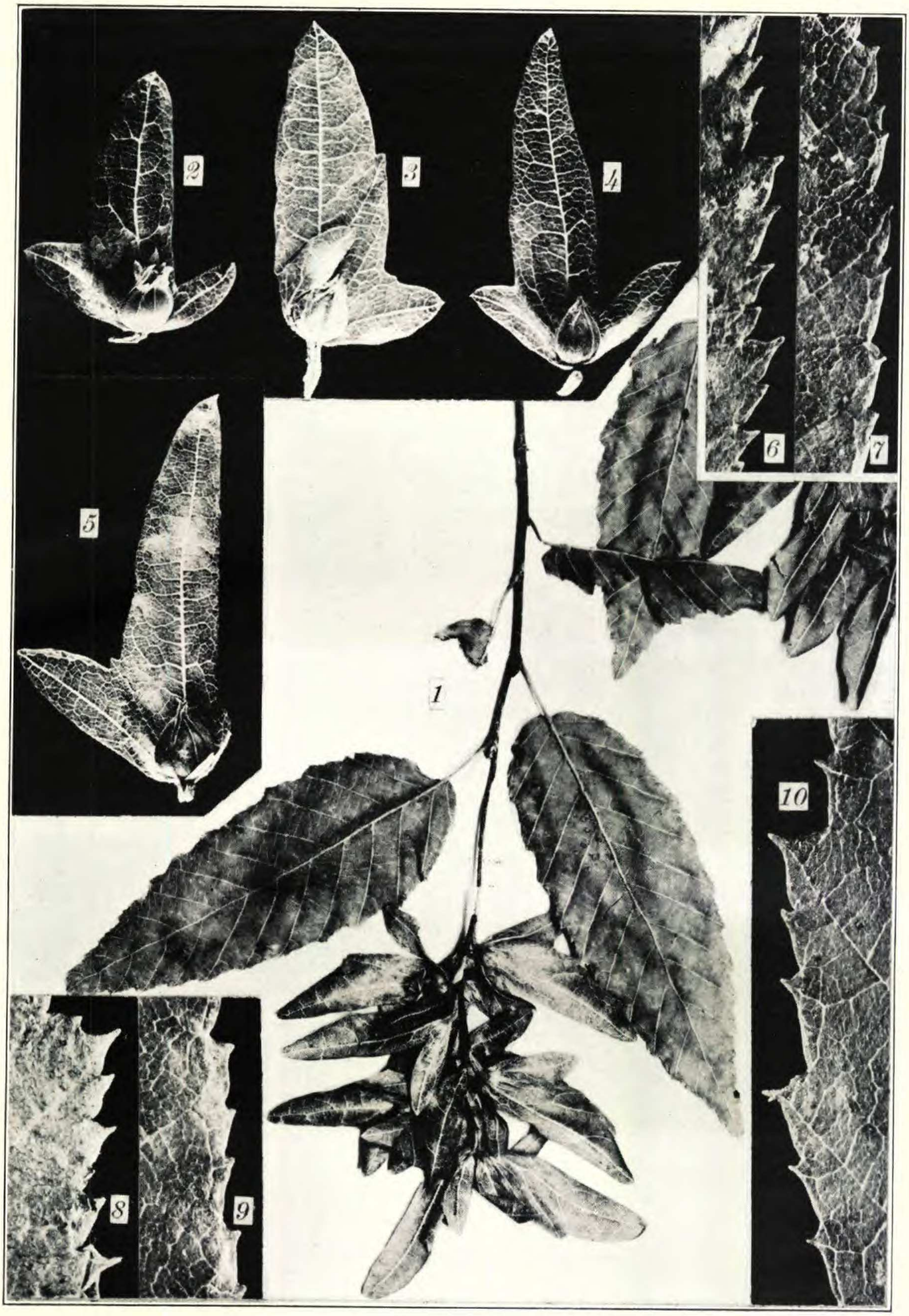


Photo. E. C. Ogden.

Carpinus caroliniana: fig. 1, fruiting branch, × 1; figs. 2–5, bracts and fruits, × 2; figs. 6–10, margins of leaves. × 5.

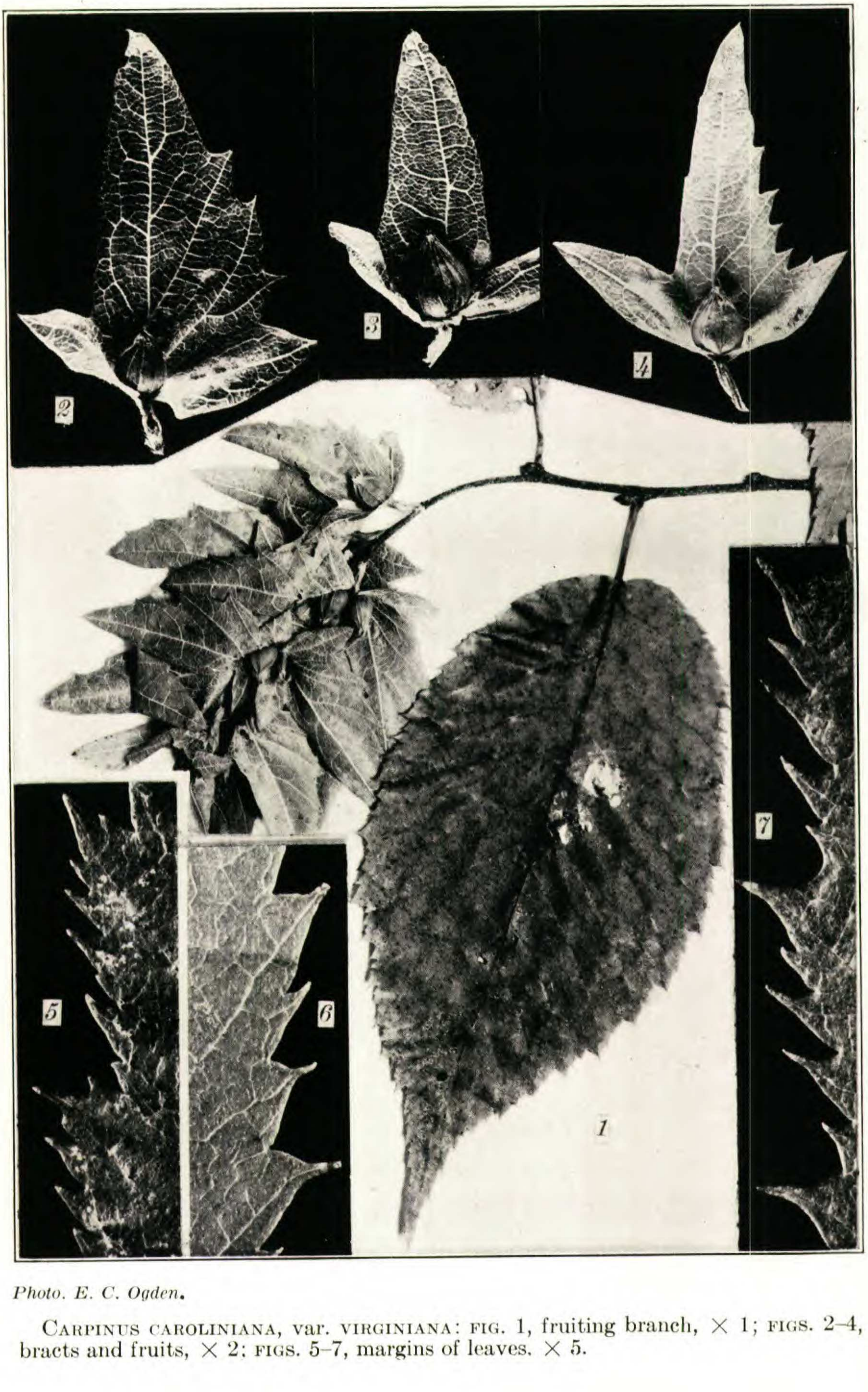


Photo. E. C. Ogden.

Carpinus caroliniana, var. virginiana: fig. 1, fruiting branch, × 1; figs. 2–4, bracts and fruits, × 2; figs. 5–7, margins of leaves. × 5.

CARPINUS CAROLINIANA Walt., var. **virginiana** (Marsh.), comb. nov. *C. Betulus virginiana* Marsh. Arb. Amer. 25 (1785). Bark blue-gray; leaves of fruiting branches oval or narrowly ovate, rounded or cordate at base, abruptly subcaudate at tip, 5–12 cm. long, 2.5–6 cm. broad, with sharp and slender teeth, the larger teeth 1–3 mm. long; bracts usually with 1–5 sharp teeth; calyx-lobes at summit of fruit short.—Nova Scotia to Ontario and Minnesota, south to uplands of North Carolina and Arkansas. PLATE 395.

BETULA NIGRA L. Local, mostly sprout-growth, perhaps of more general occurrence than appears: wet peaty clearings in woods of *Pinus serotina*, south of Grassfield, no. 3895; sandy pine woods, Sand Bridge, *F. G. & L.*, no. 4629.

CELTIS OCCIDENTALIS L., var. **submembranacea**, var. nov., foliis anguste ovatis apice longe attenuatis maturis submembranaceis utrinque viridibus.—Southeastern Virginia to eastern Georgia. The following are referred here. VIRGINIA: sandy woods, northern end of Knott's Island, Princess Anne Co., August 1, 1934, *Fernald & Long*, no. 3910 (TYPE in Gray Herb.); rich woods, Cedar Island in Back Bay, June 20, 1935, *Fernald, Griscom & Long*, nos. 4630, 4631 (trunks up to 6 dm. or 2 feet in diameter). NORTH CAROLINA: large trees seen, but no specimens taken, Knott's Island. SOUTH CAROLINA: locality not stated, *M. A. Curtis*. GEORGIA: bank of Chattahoochee River, Cobb Co., July 9, 1900, *R. M. Harper*, no. 166.

Var. *submembranacea* is at once characterized by having the mature leaves submembranaceous and deep-green on both sides, the other varieties of *Celtis occidentalis* having them firmer and thicker and paler beneath or on both sides. Although Sargent, Bot. Gaz. lxvii. 218 (1919) placed Harper's no. 166 with var. *canina* (Raf.) Sargent, l. c. 217, it has the thin and deep-green foliage of var. *submembranacea*, the mature leaves shriveling or wrinkling in drying.

ARISTOLOCHIA SERPENTARIA L. Dry, mixed woods, Little Neck, no. 3913.

POLYGONUM GLAUCUM Nutt. Sand at upper border of salt marsh, Wachapreague, no. 3919.

P. PROLIFICUM (Small) Robinson. Upper border of salt marsh, Wachapreague, no. 3918.

P. OPELOUSANUM Riddell. Frequent in sloughs and pond-margins: Pungo, *F. &. G.*, no. 2816.

P. SETACEUM Baldw. Frequent in swampy woods: Blackwater River, no. 3916; Little Neck, no. 3917.

CHENOPODIUM LEPTOPHYLLUM Nutt. Back of the sand dunes, Cape Henry, no. 3924.

Apparently the first coastal record from south of New Jersey.

ACNIDA CANNABINA L. Brackish or saline marshes, frequent: North Landing River, *F. & G.*, no. 2820.

Sesuvium maritimum (Walt.) BSP. Very scarce, damp sand and clay back of the ponds, Dam Neck, no. 3925, only one plant seen.

The first material in the Gray Herbarium from between Delaware and North Carolina.

Arenaria lanuginosa (Michx.) Rohrb. Sprawling and leaning on other vegetation, in dry, mixed woods, and supported on *Smilax* tangle to a height of 1.3 m., Little Neck, nos. 3927, 3928; similar habitat, Great Neck, *F. G. & L.*, no. 4637.

The first records from north of North Carolina.

Aquilegia canadensis L. Rich woods and banks, local, the plants very tall: Little Neck, no. 3930; Great Neck, *F. & G.*, no. 4404.

Caltha palustris L. Very local: along brook in swampy woods, Little Neck, no. 3931.

Anemone virginiana L. Dry mixed woods, Little Neck, no. 3934.

Ranunculus hederaceus L. Wet sand bordering swampy woods and thickets along Back Bay, False Cape, no. 3937; also *F. G. & L.*, no. 4642, growing with strictly indigenous species and seemingly native itself.

Asimina triloba (L.) Dunal. Scattered in rich or swampy woods, the leaves rather smaller than in most inland material, tending to be narrower and more cuneate, thus approaching the foliage of the more southern *A. parviflora* (Michx.) Dunal: Oceana, no. 3940; Great Neck, *F. & G.*, no. 4406.

Decumaria barbata L. Scattered generally through the region, climbing high on trees in rich woods and swamps: London Bridge, no. 3951; Munden, no. 3950; Great Neck, *F. G. & L.*, no. 4648.

Spiraea tomentosa L., var. rosea (Raf.) Fern. Rhodora, xiv. 190 (1912). Local: wet, peaty clearing in woods of *Pinus serotina*, south of Grassland, no. 3955.

Already known from southeastern Virginia, but perhaps isolated there. The material in the Gray Herbarium is otherwise from well inland, from Ontario and Manitoba southward to interior northern Georgia, Tennessee, Arkansas and Kansas. Typical *S. tomentosa*, of acid soils, is not represented in the Gray Herbarium from the coastal plain south of New Jersey. The plant of Grassland is quite like the inland extreme.

Amelanchier oblongifolia (T. & G.) Roem. Common in wet woods, thickets and clearings: Grassfield, no. 3958; North Landing, no. 4426.

A. canadensis (L.) Medic. Rich woods, frequent: Little Neck, no. 3956.

Crataegus Youngii Sarg. The most frequent species seen; scattered in wet woods, swamps and clearings: Grassfield, no. 3960; North Landing, *F. & G.*, no. 4427; Cedar Hill, no. 4428; Virginia Beach, *F. G. & L.*, no. 4651; Cedar Island, no. 4652.

Slight extension north, from North Carolina.

C. CRUS-GALLI L. Occasional near the coast of Princess Anne Co.: Knott's Island, no. 3961.

GEUM VIRGINIANUM L. (*G. flavum* Bickn.) Frequent in rich woods: Little Neck, no. 3963.

G. CANADENSE Jacq., var. GRIMESII Fern. & Weath. Occasional in thickets and borders of woods: Blackwater River, no. 3964; Cedar Island, *F. G. & L.*, no. 4653.

AGRIMONIA ROSTELLATA Wallr. Occasional in rich woods: Little Neck, no. 3966; Little Creek, no. 3969; Virginia Beach, *F. & G.*, no. 2822.

A. MOLLIS (T. & G.) Britton. Rich woods, Little Neck, no. 3967.

A. PARVIFLORA Ait. Border of thicket, south of Grassfield, no. 3968.

ALBIZZIA JULIBRISSIN Durazzini. Abundantly naturalized in thickets and at borders of woods: Munden, no. 2971.

TEPHROSIA SPICATA (Walt.) T. & G. Apparently local: thickets on roadside bank, Creed's, no. 3973.

LESPEDEZA STUEVEI Nutt. Dry woods: Cape Henry, *F. & G.*, no. 2837.

L. INTERMEDIA (Wats.) Britt. Dry border of woods, Pungo Causeway, *F. & G.*, no. 3839.

L. REPENS (L.) Bart. Dry woods, frequent: Virginia Beach, no. 2840.

DESMODIUM NUDIFLORUM (L.) DC. Rich woods, locally abundant: Little Neck, no. 3988; Virginia Beach, *F. & G.*, no. 2828.

D. DILLENII Darl. Dry pine woods, Cape Henry, *F. & G.*, no. 2826.

D. PANICULATUM (L.) DC. Rich woods back of Virginia Beach, *F. & G.*, no. 2832.

D. LAEVIGATUM (Nutt.) DC. Dry pine woods, Macon's Corner, Princess Anne Co., *F. & G.*, no. 2829.

D. OBTUSUM (Muhl.) DC. Mixed woods, Virginia Beach, *F. & G.*, no. 2833.

D. STRICTUM DC. Dry pine woods, Cape Henry, *F. & G.*, no. 2825.

D. MARILANDICUM (L.) DC. Mixed woods, Virginia Beach, *F. & G.*, no. 2827.

STYLOSANTHES BIFLORA (L.) BSP. Dry open woods and thickets: Lynnhaven, no. 3975; Macon's Corner, *F. & G.*, no. 2835.

S. RIPARIA Kearney. Apparently local: border of dry woods, Little Neck, no. 3976.

CLITORIA MARIANA L. Dry open clay land, Virginia Beach, nos. 3982, 3984.

SOME GEOGRAPHIC VARIETIES OF LINUM (PLATE 396).—*Linum medium*, as currently treated, consists of two strongly defined geographic varieties, differing in several fairly constant, though somewhat confluent characters, as follows.

Leaves elliptic, oval or elliptic-obovate, obtuse or subacute, opaque, without obvious veins shown by transmitted light, only the uppermost subulate-tipped, 25–40 below the inflorescence: sepals about equaling to shorter than the capsule; the longer 2–3 mm. long; the inner ovate, entire or but sparingly glandular-ciliate: false septa strongly developed, the capsules promptly splitting into 10 valves. . . . *L. medium*, var. *typicum*.

Leaves linear or linear-lanceolate to lance-elliptic, subtranslucent, with evident veins shown by transmitted light, all but the lowermost with prolonged subulate tips, 30–150 below the inflorescence: sepals mostly exceeding the capsule; the longer 2.5–5 mm. long; the inner ovate to lanceolate, usually copiously glandular-ciliolate: false septa less regularly developed, the capsules often splitting into only 5 carpels or tardily or incompletely into 10 valves. . . . . Var. *texanum*.

L. MEDIUM (Planchon) Britton, var. **typicum.** *L. virginianum*, var. β. *medium* Planchon, Lond. Journ. Bot. vii. 480 (1848). *L. medium* (Planch.) Britton in Britt. & Brown, Ill. Fl. ii. 349 (1897), as to name-bringing synonym, not as to description and figure. *Cathartolinum medium* (Planch.) Small. N. Am. Fl. xxv^1. 72 (1907), as to name-bringing synonym, not as to description.—Southern Ontario (York Co. to Bruce Co.), northwestern Pennsylvania and northern Ohio. FIGS. 1–5.

Var. **texanum** (Planch.), comb. nov. *L. virginianum*, var. δ ? *texanum* Planch. l. c. 481 (1848). *L. virginianum*, γ. *angustifolium* Engelm. in Gray, Pl. Wright. 26 (1852). *L. medium* Britt., l. c. in part (description and fig. 2261). *Cathartolinum medium* Small, l. c. in part (description).—Florida to Texas, north to southwestern Maine, northeastern Massachusetts, southern Vermont, eastern Pennsylvania, West Virginia, southern Michigan, northern Indiana, Illinois, Missouri and Oklahoma. FIGS. 6–10.

Linum medium was first recognized by Planchon who treated it, var. *texanum* and *L. floridanum* as varieties of *L. virginianum* L. He correctly understood the latter species, his *L. virginianum*, var. α *microcarpum* being based on the type of *L. virginianum* in the Linnean herbarium. The fruit of the inclusive *L. virginianum* was defined by Planchon with almost complete false septa such as occur in typical *L. virginianum* and in typical *L. medium* ("capsulae parvae depresso-globosae semiseptis fere completis"), while his material of var. *texanum* was immature and Planchon thought that it, as well as *L. floridanum*, might prove to be a distinct species. Planchon's account of the two varieties of *L. virginianum*, here specially significant, was as follows:

> Var. β. *medium*,—humilius, ramulis fructiferis strictis erecto-patentibus, calyce capsulam (praecedenti [var. *microcarpum* or typical *L. virginianum*] paulo majorem) paulo superante; fenestra loculorum lineari-angustissima. . . .
>
> Var. δ (?) *Texanum*,—habitu var. α. [*i. e.* elatius, ramulis fructiferis divaricato-patentibus], sed floribus majoribus, laciniis calycinis valde inaequalibus, majore pedicellum brevem et capsulam (non plene maturam) obtusam fere duplo superante. An sp. distincta?

Hab. . . . Var. β, Canada, lacus Huron, *Dr. Todd* in Hb. Hook.; Kentucky, *Dr. Short*, ibid.; alibi verosimiliter in Prov. confederatis.— . . . Var. δ, in ditione Texana, prope S. Felipe, *Drummond*, no. 38. coll. tertiae.

I have not seen the Todd material, which should stand as the type of *Linum medium*, but all other material from southern Ontario, where Todd collected, well matches Planchon's specifications: low, fruiting branches strict, suberect; calyx little exceeding the capsule; and very narrow fenestration of the valves of the fruit. The Ontario plant with these characters comes from shores of Lakes Huron, Ontario and Erie. It ranges from 1.3–4.5 dm. high and has the characters enumerated in the key above.

Fig. 1 shows a characteristic specimen, × ¾ from the Bruce Peninsula, Lake Huron, with enlarged details of the characteristic leaf, calyx, capsule and valves. It is probable that the Kentucky material seen by Planchon was not strictly identical with it.

Linum medium, var. *texanum*, usually taller, with more divergent fruiting branches and with the calyx twice as long as the (young) capsule, was based (as *L. virginianum*, var. *texanum*) on *Drummond*, no. 38 from Texas. An excellent sheet of no. 38, with capsules evidently more mature than in the material seen by Planchon, is in the Gray Herbarium. A small plant from Virginia, closely matching it, is reproduced, × ¾, as fig. 6; and details of leaf, calyx, fruit and valves from it are added. Var. *texanum* may be as low as the average var. *typicum* and its inflorescence may then have short branches. On the whole, however, it is taller, ranging from 1.5–7.5 dm. high, with very many more and narrower, sharp-pointed leaves and elongate branches. As to the septation of the fruit, the 5 carpels in the northern type promptly separate into 10 valves, as Planchon implied and as they usually do in *L. virginianum;* but in the southern variety the carpels are often undivided, though septation occasionally occurs. In this character they show parallelism with the usually non-septate carpels of the southern *L. floridanum* (Planch.) Trel. and their very prompt septation in the more northern and inland *L. intercursum* Bickn. The artist who drew *Linum* for Britton & Brown's Illustrated Flora caught the point: *L. virginianum* (fig. 2260) and *L. striatum* (fig. 2263) showing, correctly, the carpels promptly septate, resulting in 10 valves; *L. floridanum* (fig. 2262) and *L. medium* (var. *texanum*), fig. 2261 (the latter with "leaves . . . lanceolate to linear-lanceolate, acute" and with sepals shown as exceeding the capsule) both correctly illustrated with non-septate valves. But, whereas var.

texanum has carpels and their separated valves barely different from those of typical *L. medium*, *L. intercursum* and *L. floridanum* have marked differences in leaf, fruit and valves, which indicate that they are distinct species; the former of the northern coastal plain, from Massachusetts to Virginia, thence inland and south to western Georgia and northern Alabama; the latter restricted to the southern coastal plain, north to southern Illinois and eastern North Carolina. FIGS. 11–14 show the details of *L. floridanum*, a plant with very numerous (50–150) leaves, the middle and upper (FIG. 11) linear, opaque (FIG. 12) to transmitted light, and with a slender subulate tip 0.5–1 mm. long; capsule (FIG. 13) globose-ovoid and rounded at summit; and individual carpels and valves (FIG. 14) blunt or with short incurved tips. *L. intercursum*, on the other hand, has fewer (15–60) leaves, these (FIG. 15) blunter, showing evident venation (FIG. 16) by transmitted light; the capsules (FIGS. 17 and 18) ovoid and pointed; the individual carpels (FIG. 19) with erect, acuminate beaks.

Linum striatum is separated in our keys by special emphasis on the opposite leaves—"leaves below the branches mostly all opposite" (*Britton & Brown*); "Stem-leaves chiefly opposite" (*Robinson & Fernald*). To the field-botanist who has known the species only on Cape Cod, the islands of southeastern Massachusetts or Block Island, off the coast of Rhode Island, such an emphasis might seem insufficient; he would say: leaves of the stem and of the primary axis of the inflorescence all or nearly all opposite. On the mainland of southern New England, however, more of the leaves are alternate; and southward, through Virginia, the Carolinas and Georgia and westward, many or most of the leaves are alternate. It thus becomes interesting to note Walter's original diagnosis of *L. striatum* of Carolina:

> *striatum* 2. *floribus terminalibus*, foliis subovatis alternis, caule ramosiori *striato* foliorum *nervo marginibusque decurrentibus*.

In general, all the southern material and most of that on the continent northeastward to northeastern Massachusetts and inland to the Great Lakes region has the 5–25 upper leaves of the stem and all or essentially all along the primary axis of the loosely branched inflorescence alternate, only the lower 5–10 (rarely –14) nodes having them opposite, thus sufficiently approximating Walter's diagnosis, "foliis . . . alternis." As already stated, the plant of Cape Cod, Martha's Vineyard, the Elizabeth Islands and Nantucket, Massachusetts and of Block Island, off the coast of Rhode Island, has most of the leaves (all below the inflorescence and several pairs on the main axis) opposite. Consequently, the lower and often essentially all the branches of the inflorescence are opposite, producing an inflorescence strikingly unlike that of the continental and southern plant, in which they are alternate. The northern insular and peninsular extreme may be called

LINUM STRIATUM Walt., var. **multijugum**, var. nov., foliis caulinis oppositis, foliis ramibusque imis panicularum oppositis.—MASSACHUSETTS: peaty margin of Quanset Pond, Orleans, September 10, 1927, *Fernald*, no. 620 (TYPE in Gray Herb.); moist sandy and peaty shore, second small pond east of Lizzie's Pond, Chatham, *Fernald & Long*, no. 18,663; open mossy bog, Harwich, August 5, 1913, *Weatherby* (slightly transitional); borders of peaty quagmires east of Buck Pond, Harwich, *Fernald & Long*, no. 17,018; near Pleasant Lake, Brewster, August 3, 1911, *E. W. Sinnott;* cranberry bogs near Walker Pond, Brewster, *Fernald*, no. 17,017; dry sandy upper beach of second pond [Seth's P.] north of No Bottom Pond, Brewster, *Fernald & Long*, no. 17,019; damp sandy and peaty beach of Blueberry Pond, Brewster, *Fernald*, in Pl. Exsicc. Gray. no. 371; peaty margin of Sheep Pond, Cuttyhunk, *Fogg*, no. 2528; border of Waquatuquait Pond, Nantucket, September 7, 1885, *Deane*. RHODE ISLAND: various stations on Block Island, August 17, 1892, *J. F. Collins; Fernald & Long*, no. 9770, *Fernald, Hunnewell & Long*, no. 9771; *Fernald, Long & Torrey*, no. 9772; September 28, 1916, *Collins, Spalding & Gravatt;* August 10, 1919, *C. B. Graves.*

Linum virginianum, var. β. *oppositifolium* Engelm. in Gray, Pl. Wright. 26 (1852) was based on typical *L. striatum*, a plant with which Engelmann was otherwise unfamiliar. Exceptional individuals of *L. striatum* from the mainland of southern New England and from Long Island and New Jersey approach var. *multijugum*.

OXALIS FILIPES Small. Frequent in woods and thickets: Great Neck, *F. & G.*, no. 4443; Benefit, *F. & G.*, no. 4444; Knotts' Island, no. 3998.

POLYGALA INCARNATA L. Dry open clay lands and thickets, frequent in Princess Anne Co.; Virginia Beach, no. 4006.

P. MARIANA Mill. Common in dry or moist open soil: Virginia Beach, no. 4005; Little Neck, no. 4004; Blackwater River, no. 4003; Pungo Causeway, *F. & G.*, no. 2846.

P. VERTICILLATA L. Local: dry open clay lands and thickets, Virginia Beach, no. 4001.

CNIDOSCOLUS STIMULOSUS (Michx.) Engelm. & Gray. Sandhills, Cape Henry, no. 4007.

CROTON GLANDULOSUS L., var. SEPTENTRIONALIS Muell. Arg. Dry sand barrens, Cape Henry, *F. & G.*, no. 2847.

ACALYPHA VIRGINICA L. Occasional, in open clay of thickets and fields: Blackwater River, no. 4009.

A. DIGYNEIA Raf. Local, in open clay at border of woods, east of Little Creek, no. 4008.

PHYLLANTHUS CAROLINIENSIS Walt. Ditch in open clay at border of woods, east of Little Creek, no. 4011.

ILEX VOMITORIA Ait. Frequent in sandy woods and thickets: Knotts' Island, no. 4021; Creed's, *F. & G.*, no. 4450.

CEANOTHUS AMERICANUS L. Infrequent: dry, mixed woods, Little Neck, no. 4025.

AMPELOPSIS ARBOREA (L.) Koehne. Local: thickets on sand dunes south of False Cape, no. 4026.

ASCYRUM STANS Michx. Frequent in borders of woods and clearings: Little Neck, no. 4040; Grassfield, no. 4041.

HYPERICUM PUNCTATUM Lam. Occasional: dry, mixed woods, Little Neck, no. 4038.

We did not see the following, which has been collected in Henry Co.

HYPERICUM PUNCTATUM Lam., var. **pseudomaculatum** (Bush), comb. nov. *H. pseudomaculatum* Bush in Britton, Man. 627 (1901); Britton in Britton & Brown, Ill. Fl. ed. 2, ii. 534, fig. 2894 (1913).

When first published by Dr. Britton, Bush's *Hypericum pseudo maculatum* was cited only from Missouri, and distinguished from *H. punctatum* only by slightly longer petals. In his second publication, however, he separated it also on its acute leaves and more attenuate sepals, and extended its range eastward to Florida and South Carolina. As to length of petal, it is perfectly simple to find in the herbarium sheets of specimens with the upper leaves subdeltoid and acute (*H. pseudomaculatum*) but with petals as small as in the smallest-flowered *H. punctatum*. In fact, the smallest-flowered extreme, *H. micranthum* Choisy, may have the uppermost leaves either rounded at summit, as in typical *H. punctatum*, or deltoid-ovate and acute, as in *H. pseudomaculatum*. Var. *pseudomaculatum*, which is a southern extreme distinguished primarily by having the uppermost and bracteal leaves acute, extends from Florida to Texas, northward to southern Virginia (Martinsville, Henry Co., *Heller*, no. 1095), western Tennessee, Illinois, Missouri and Oklahoma.

H. NUDIFLORUM Michx. Local: shrubs 0.5–0.9 m. high, at border of gum swamp, Oceana, no. 4039.

Apparently the first record from north of North Carolina.

H. GYMNANTHUM Engelm. & Gray. Frequent in damp sands or clays, Princess Anne Co.: Cape Henry, no. 4036; Virginia Beach, no. 4035; Rifle Range, no. 4037.

H. PETIOLATUM Walt. Gum swamps: Oceana, no. 4032; North Landing, no. 4031.

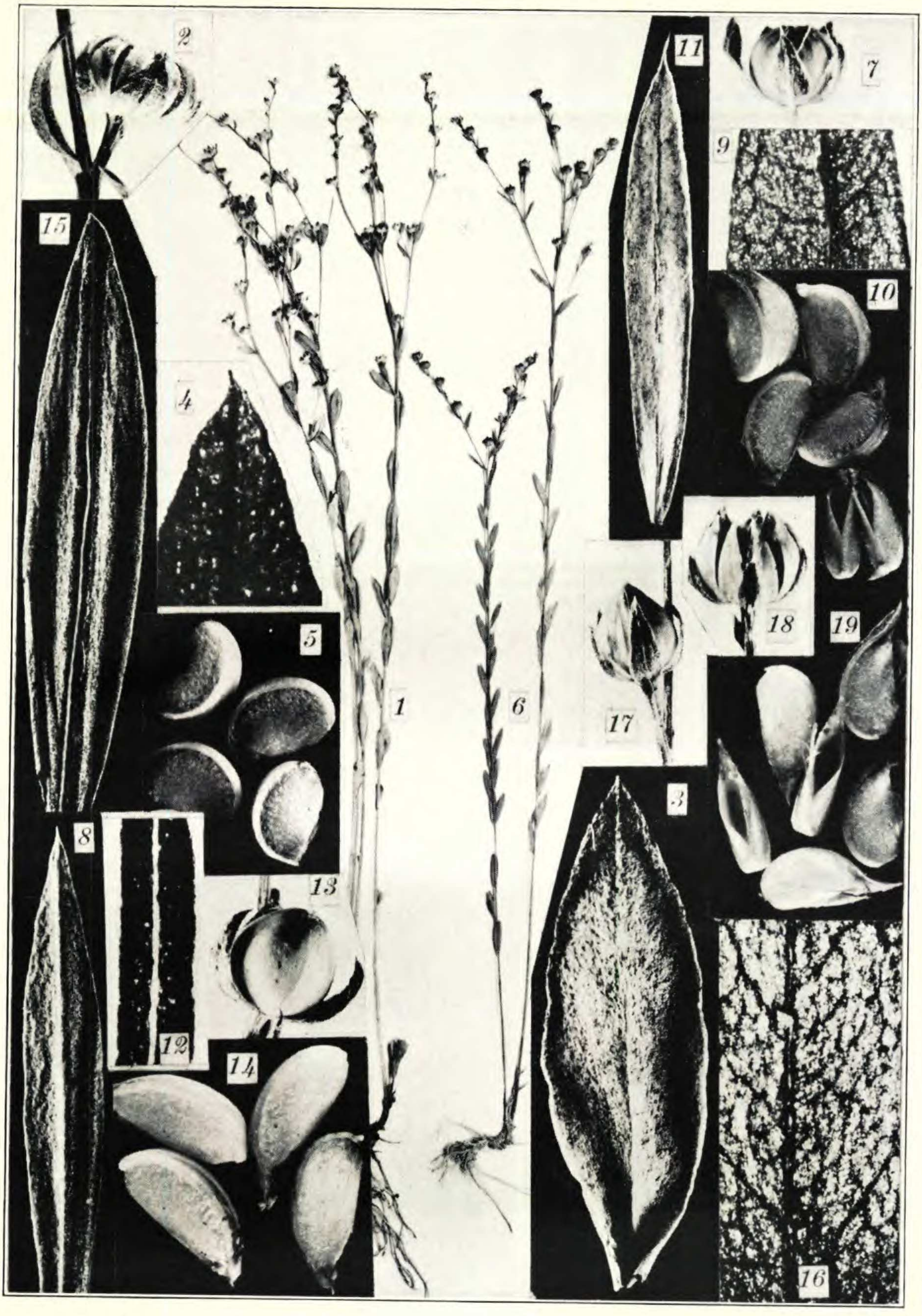


Photo. E. C. Ogden.

LINUM: plants, × ¾; leaves, × 5; details of leaf-venation, × 10; capsules, × 5; ripe carpels, × 8.

L. MEDIUM: FIG. 1, small plant; FIG. 2, capsule; FIG. 3, leaf; FIG. 4, portion of leaf (opaque), by transmitted light; FIG. 5, ripe carpels.

L. MEDIUM, var. TEXANUM: FIG. 6, small plant; FIG. 7, capsule; FIG. 8, leaf; FIG. 9, portion of leaf, by transmitted light; FIG. 10, ripe carpels.

L. FLORIDANUM: FIG. 11, leaf; FIG. 12, portion of leaf (opaque), by transmitted light; FIG. 13, capsule; FIG. 14, ripe carpels.

L. INTERCURSUM: FIG. 15, leaf; FIG. 16, portion of leaf, by transmitteed light; FIGS. 17 and 18, capsules; FIG. 19, ripe carpels.

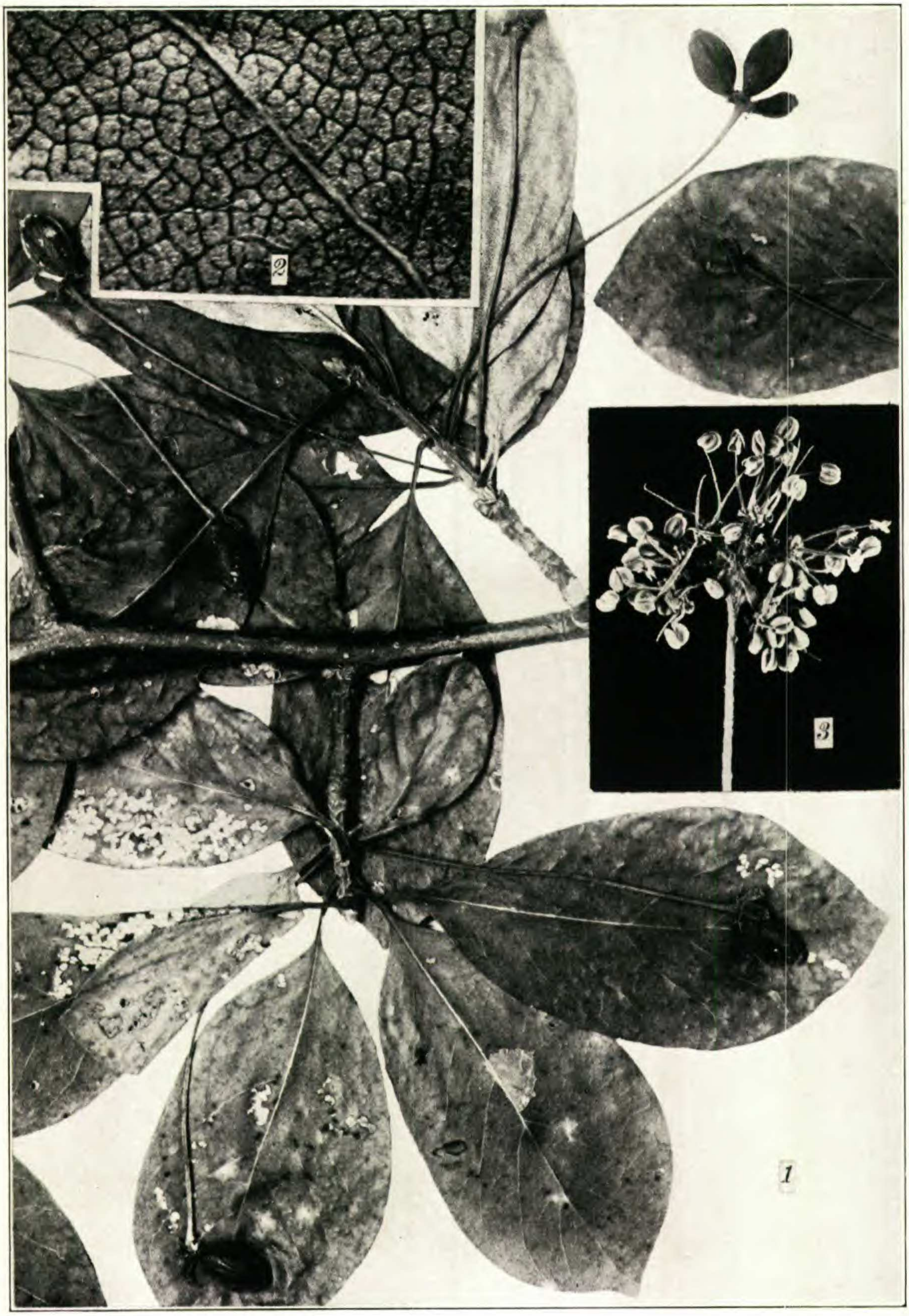


Photo. E. C. Ogden.

Nyssa sylvatica, var. typica: fig. 1, fruiting branch, × 1; fig. 2, smooth lower surface of leaf, × 10; fig. 3, staminate inflorescence, × 3.

LECHEA RACEMULOSA Michx. Occasional: border of woods, east of Little Creek, no. 4049.

VIOLA AFFINIS LeConte. Dry, mixed woods, Little Neck, no. 4056.

V. SORORIA Willd. Dry, mixed woods, Little Neck, no. 4055.

V. BRITTONIANA Pollard. Frequent in swales and damp open soil: Rifle Range, no. 4053, also *F. & G.*, no. 4469; Sand Bridge, *F. G. & L.*, no. 4676; Munden, *F. & G.*, no. 4468; North Landing, *F. & G.*, no. 4467; Blackwater River, no. 4054; Richard Swamp, *F. & G.*, no. 4466.

V. PECTINATA Bickn. Local: wood-road in pine woods, Dam Neck, no. 4051; damp peat, Rifle Range, *F. & G.*, no. 4463.

Apparently the first record from south of Maryland. Our collections are quite like Bicknell's original material.

LUDWIGIA GLANDULOSA Walt. Large bushy-branched plants 1 m. high, in gum swamp south of North Landing, no. 4076.

Apparently the first station known north of South Carolina.

L. PILOSA Walt. Wet, peaty clearings in woods of *Pinus serotina*, south of Grassfield, no. 4074, there growing with L. LINEARIS Walt. (our no. 4075).

The first evidence, apparently, of *Ludwigia pilosa* from north of South Carolina.

L. BREVIPES (Long) E. H. Eames, RHODORA, xxxv. 228 (1933) (*Ludwigiantha brevipes* Long). Western Branch of James River, near Portsmouth, August, 1840, *F. Rugel* in Gray Herb.; shallow water, pond along railroad, 37th Street Station, Cape Henry [Virginia Beach], June 26, 1922, *Randolph & Randolph*, no. 331; shallow pools and wet sand of dune-hollows, south of False Cape, Princess Anne Co., no. 4070.

Our station, south of False Cape, is very extensive, within a short distance of the North Carolina line and on one of the outer sand-bar islands which extend to Cape Hatteras and beyond. The species will doubtless be found in North Carolina. The type station, on the New Jersey coast, is the only one known north of Virginia.

HYDROCOTYLE CANBYI C. & R. Frequent in Princess Anne Co.: silts near outlet of Rainey's Pond, Sand Bridge, no. 4090; damp sand and clay back of the ponds, Dam Neck, no. 4091.

H. RANUNCULOIDES L.f. Local: in and by a brook, inundated swale back of the dunes, False Cape, no. 4086.

CICUTA CURTISII C. & R. Gum swamps: Oceana, no. 4083.

ANGELICA VILLOSA (Walt.) BSP. Border of dry, mixed woods, Little Neck, no. 4082.

CORNUS STRICTA Lam. Swamps and margins of creeks: False Cape, no. 4100; Indian Creek, *F. G. & L.*, no. 4648.

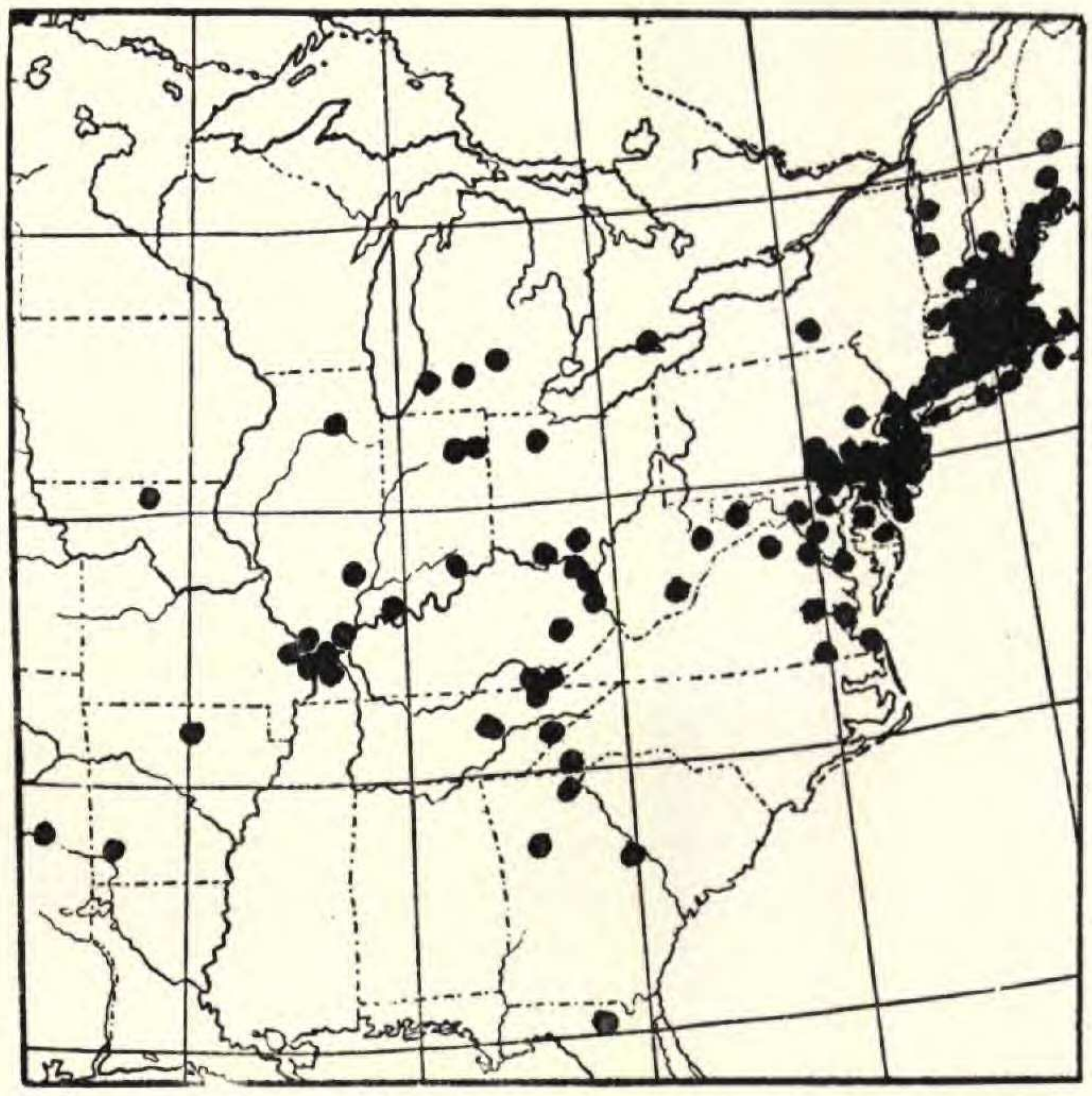
THE VARIETIES OF NYSSA SYLVATICA (PLATES 397–400).—In Princess Anne County we were very much perplexed by the genus

Nyssa. *N. aquatica* L., with its large solitary fruits, was perfectly clear, but the trees with small paired or triple fruits showed such diversity of foliage, two of the extremes often growing within a few miles of each other, that it has seemed important to settle, so far as possible, their identities. Very briefly, I find no very positive differences in flowers and fruits in the series including *N. sylvatica* Marsh. and *N. biflora* Walt. Another of the series, not recently recognized, is *N. caroliniana* Poiret, in which the foliage and fruits are somewhat larger than in the other two, but with so many transitions that I am forced to treat them as well marked varieties. From the description "with oval, or rather inverse egg-shaped leaves" and from the region whence it came (Pennsylvania) *N. sylvatica* Marsh. is clearly the northern extreme, with long fruiting peduncles, short staminate pedicels and elliptic to obovate, abruptly short-pointed and comparatively small leaves smooth beneath. *N. biflora* Walt., from the brief diagnosis "foliis oblongo-lanceolatis integerrimis, laevibus", is safely identified as the narrow-leaved tree with short peduncles already generally understood as *N. biflora*. *N. caroliniana* Poir., with leaves long-tapering to both ends and with long staminate pedicels, I take to be the tree of the series with longest leaves, conforming to the general outline shown in Poiret's illustration. A fourth extreme, somewhat similar to *N. caroliniana*, but with broadly oval to short-oblong leaves, is in some points about as near true *N. sylvatica* but usually with shorter fruiting peduncles and longer staminate pedicels; in other points suggestive of a broad-leaved *N. biflora*. This is distinctly a southern tree and I am unable to identify it with any described form. In order to show the four varieties of *N. sylvatica*, as I view them, it seems desirable that they be illustrated (PLATES 397–400). The maps of ranges are based on all the material at the Arnold Arboretum and the Gray Herbarium.

The following brief characterizations, with the illustrations, may make my treatment clear.

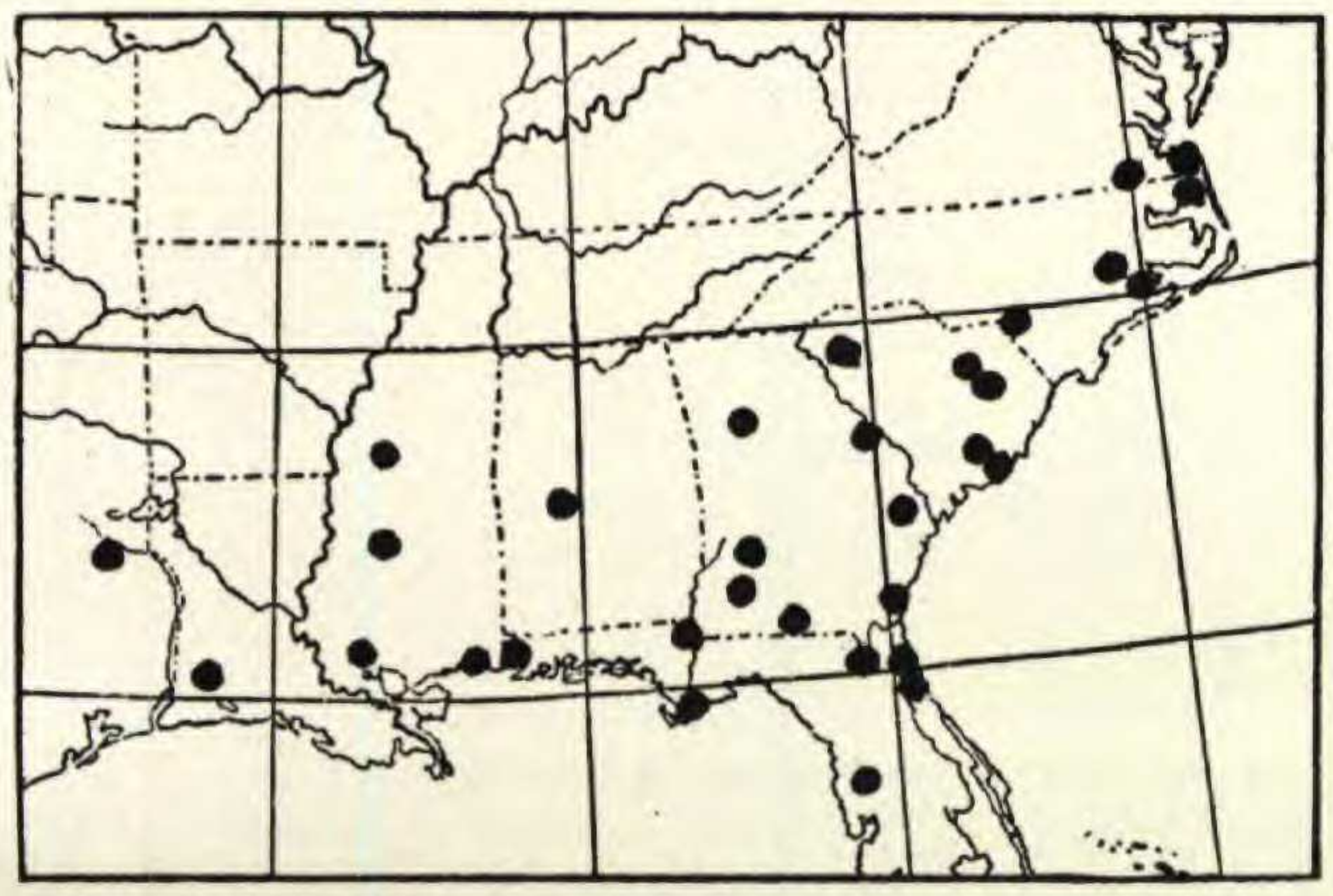
NYSSA SYLVATICA Marsh., var. **typica**. *N. sylvatica* Marsh. Arb. Amer. 97 (1785). *N. multiflora* Wang. Nordam. Holz. 46, t. 16, fig. 39 (1787). *N. multiflora*, var. *sylvatica* (Marsh.) Wats. Bibl. Index, 442 (1878).—Leaves adjacent to flowers and fruits (excluding those of vegetative sprouts and leading tips) obovate to elliptic, frequently with short abrupt tip, firm or subcoriaceous, lustrous above, smooth (rarely papillate) and glabrous or glabrate (except sometimes on nerves) beneath, 3–8(–10) cm. long, 2–6 cm. broad: fruiting peduncles (1.5–)3–6.5 cm. long: staminate pedicels 0.5–4 mm. long.—West-central Maine to northern Missouri, south to Virginia and Tennessee and more locally to northern Florida and northeastern Texas. PLATE 397; MAP 1.

Var. BIFLORA (Walt.) Sarg. Sylva, v. 76, t. ccxviii. (1893). *N. biflora* Walt. Fl. Car. 253 (1788).—Leaves coriaceous, those adjacent to flowers and fruits oblanceolate, narrowly obovate or narrowly oblong-lanceolate, round-tipped, obtuse or subacute, lustrous above, smooth or papillate beneath, 2.5–6(–9) cm. long, 1.5–3.5 cm. broad: fruiting peduncles 1–3.5 cm. long; staminate pedicels 3–5 mm. long.—Coastal plain, southeastern Maryland to Florida, thence to eastern Texas, inland, locally, into the piedmont. PLATE 398; MAP 2.[1]



MAP 1. Range of NYSSA SYLVATICA, var. TYPICA.

Although Sargent in his later work (Manual) and Small maintain *Nyssa biflora* as a species, said to have "Stone prominently ribbed" (*Sargent*) as opposed to "Stone indistinctly ridged" in *N. sylvatica*, I get little distinction; to me they are both furrowed but without any striking difference. When growing in "gum swamps," with abundant water, the bases of the trunks of var. *biflora* are enlarged or swollen, but when growing in damp sands, away from standing water, they do not show this basal enlargement. I am, therefore, in full accord with Sargent's earlier statement, in the Sylva: "This aquatic tree often appears distinct enough from the northern



MAP 2. Range of NYSSA SYLVATICA, var. BIFLORA.

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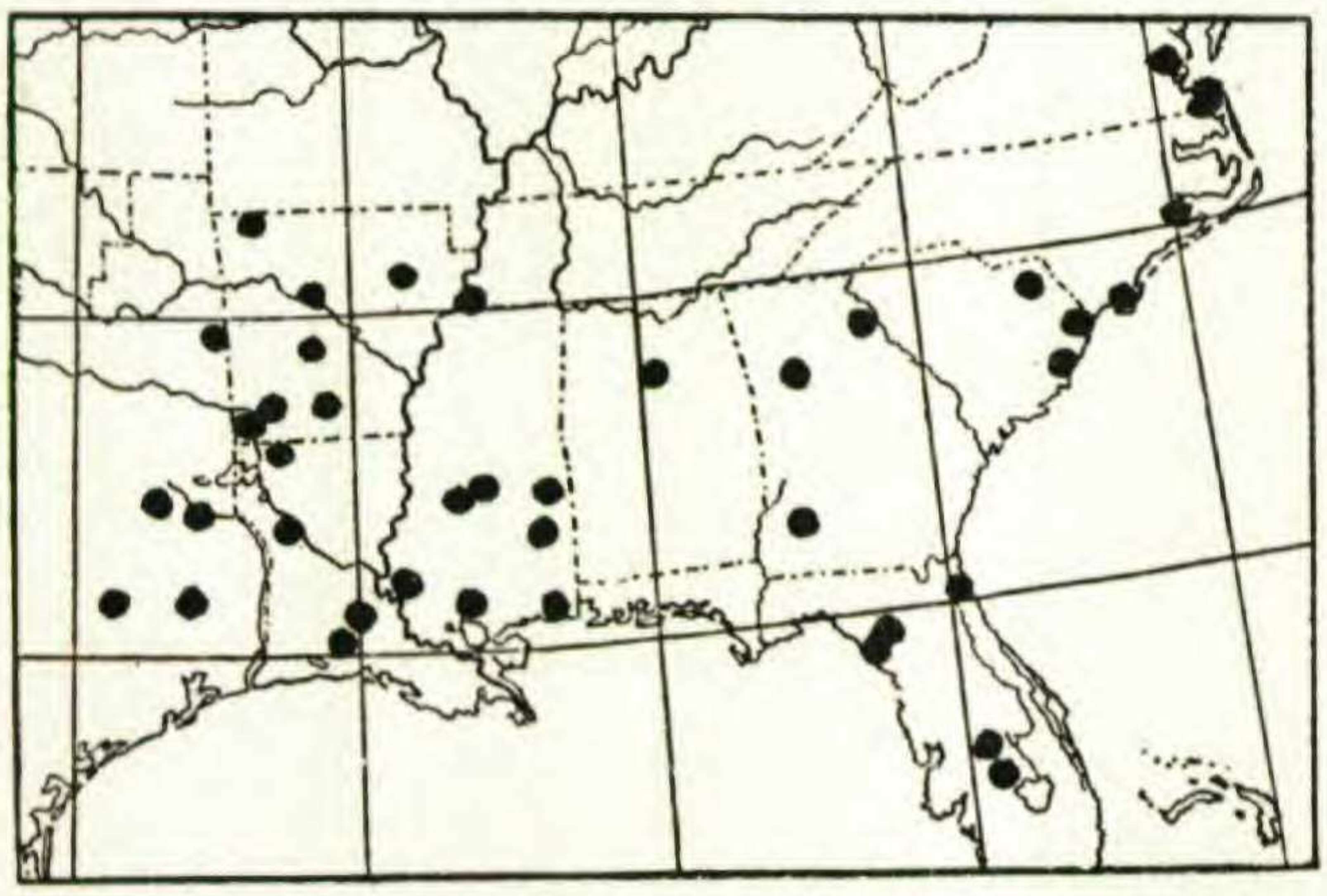
[1] The range of var. *biflora* should be indicated as extending northward to southeastern Maryland.

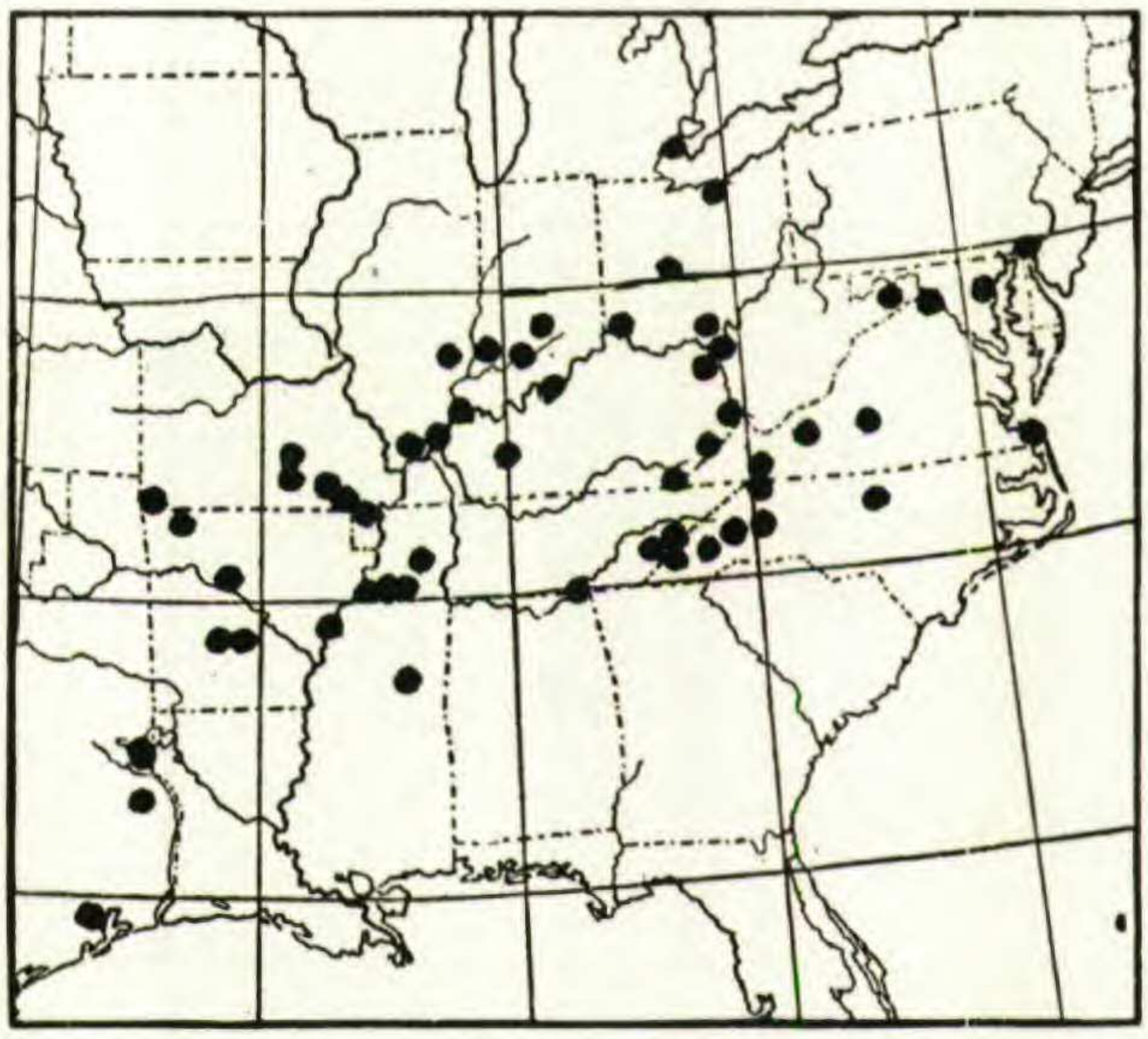
Tupelo, but the extreme forms are connected by others intermediate between the two in the shape and size of their leaves and in the shape and ridges of their stones." Var. *biflora* passes into

Var. **dilatata**, var. nov. (TAB. 399), foliis maturis late ovalibus vel rotundato-oblongis vel late obovatis apice rotundatis subcoriaceis supra lucidis subtus planis vel papillatis pilosis vel glabris; fructi pedunculis 1.5–5 cm. longis; florum staminiorum pedicellis 3–8 mm. longis.—Coastal plain, rarely piedmont, southeastern Virginia to Florida, thence to eastern Texas, eastern Oklahoma and Arkansas. TYPE (PLATE 399): low ground, sandy oak-pine woods, 4 miles southwest of Hartwell, Hart Co., Georgia, August 19, 1927, *Wiegand & Manning*, no. 2339 (Gray Herb.). MAP 3.



MAP 3. Range of NYSSA SYLVATICA, var. DILATATA.

Var. **caroliniana** (Poir.), comb. nov. *N. Caroliniana* Poir. in Lam. Encycl. iv. 507 (1796) and Ill. iii. 442, t. 851, fig. 1 (1823).—Leaves submembranaceous to thin-coriaceous; those adjacent to flowers and fruit rhombic-oval to rhombic-obovate, tapering subequally to the usually acuminate (rarely blunt) base and apex, papillose and frequently pilose beneath, (6–) 8–15 cm. long, 3.5–8 cm. broad: fruiting peduncles 1.5–5 cm. long; pedicels of staminate flowers 2–4.5 mm. long. —Chiefly in the uplands and the interior, Chester County, Pennsylvania to Essex Co., Ontario, thence to southeastern Virginia, interior North Carolina, Tennessee, northern Mississippi and eastern Texas. PLATE 400; MAP 4.



MAP 4. Range of NYSSA SYLVATICA, var. CAROLINIANA.

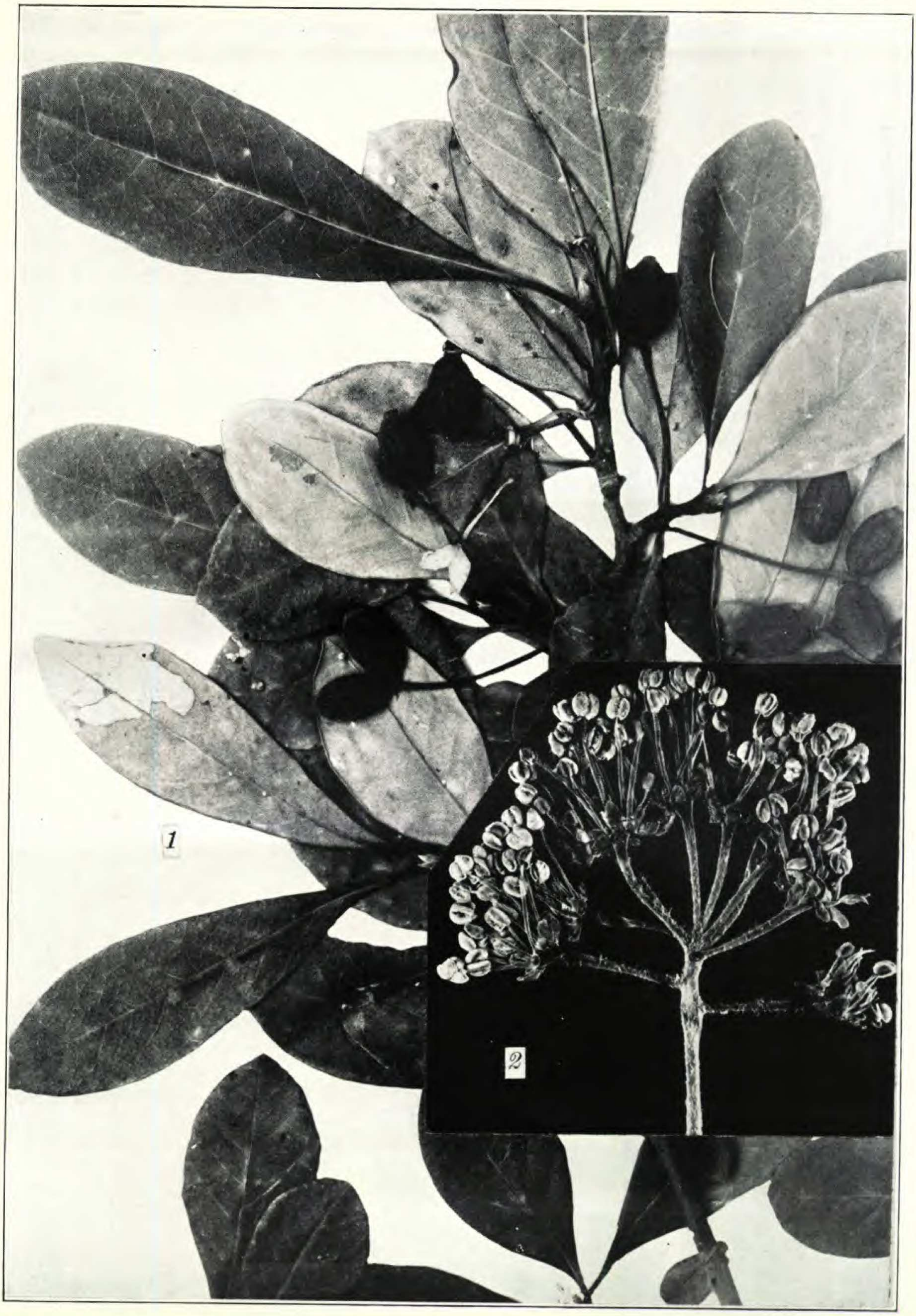


Photo. E. C. Ogden.

NYSSA SYLVATICA, var. BIFLORA: FIG. 1, fruiting branch, × 1; FIG. 2, staminate inflorescence, × 3.

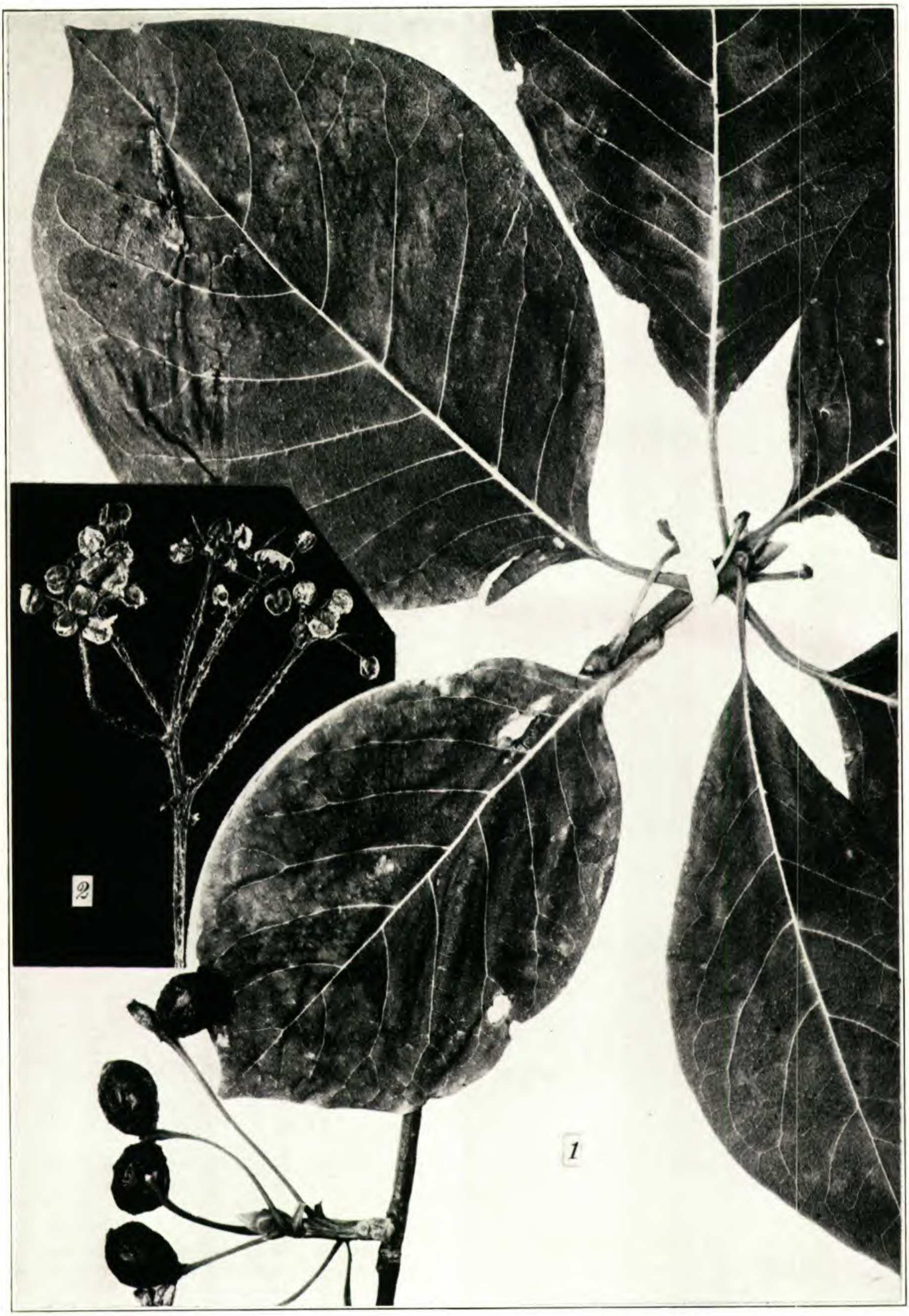


Photo. E. C. Ogden.

NYSSA SYLVATICA, var. DILATATA: FIG. 1, fruiting branch (TYPE), × 1; FIG. 2, staminate inflorescence, × 3.

The dominance of var. *caroliniana* in the Appalachian and Ozark Uplands, whence it spreads locally into the lower levels, is striking. It there reaches higher altitudes than typical *Nyssa sylvatica,* some collections (for example, from Walker Mountain, Smyth Co., Virginia, *Small*) recorded as from 3000 feet, others from "summits" of mountains. Within four miles of the Atlantic, on the outer coastal plain, we found var. *caroliniana* (Oceana, Princess Anne Co., no. 4097) associated with other inland types (*Asimina triloba, Morus rubra, Ulmus americana, Carex virescens,* etc.) and only a short distance from colonies of *Thelypteris hexagonoptera, Liparis liliifolia, Liriodendron Tulipifera, Oxydendrum arboreum* and other Alleghenian types. Within an equally short distance were the coastal plain *N. sylvatica,* var. *biflora* and hundreds of other southern coastal plain types.

I am placing the Alleghenian tree with *Nyssa caroliniana* Poir. on account of Poiret's figure, which seems to represent this variety. His description called for "feuilles . . . ovales, . . . aiguës à leurs deux extremités, . . . glabres des deux côtés . . . Cet arbre croît naturellement dans la Virginie & la Caroline." At the same time Poiret published *N. canadensis:* "Cette espèce a beaucoup de rapports avec le précédente, peut-être même n'en est-elle qu'une variété, quoique d'un pays différent. C'est le même port, la meme disposition dans les feuilles & les fleurs; cependant les feuilles, au lieu d'etre glabres, sont fortement velues en-dessous sur leurs principales nervures, & ciliées à leur circonference . . . Cette plante a été envoyée du Canada au citoyen Lamarck." Without seeing Poiret's type it is not possible to say whether he had var. *caroliniana* or var. *typica,* both of which extend into southernmost Canada.

VACCINIUM MACROCARPON Ait. Swampy or inundated woods, north of Blackwater River, Princess Anne Co., no. 4123.

It was certainly surprising to find the cranberry on the coastal plain within 10 miles of North Carolina. The species has been known southward to the mountains of North Carolina and Kearney found it at Virginia Beach; but at our station in Princess Anne Co. it was growing beneath *Cladium jamiacensis* and *Smilax laurifolia* and associated with many other southern, rather than northern types.

LYSIMACHIA QUADRIFOLIA L. Occasional in woods: Virginia Beach, no. 4125.

POLYPREMUM PROCUMBENS L. Occasional in damp sand or clay: Cape Henry, no. 4130; North Landing, *F. & G.*, no. 2875.

SABATIA BRACHIATA Ell. Local: dry, mixed woods, Little Neck, no. 4134.

An extension north from North Carolina.

S. ANGULARIS (L.) Pursh. Frequent in woods, thickets and clearings, very showy in late July and early August: Virginia Beach, no. 4132.

S. GRACILIS (Michx.) Salisb. Swales back of the dunes, Rifle Range, south of Rudy Inlet, no. 4133.

As pointed out in RHODORA, xxxiv, 27, *Sabatia gracilis* is a southern species, heretofore known north to eastern North Carolina. It is quite distinct from the inland and northern *S. campanulata* (L.) Torr., with which it has been confused.

BARTONIA VIRGINICA (L.) BSP. Apparently local: damp sandy and peaty depressions back of the dunes, Rifle Range, no. 4136.

GENTIANA PARVIFOLIA (Chapm.) Britton. Local: with the last, no. 4135.

ASCLEPIAS TUBEROSA L. Common, very conspicuous in June, in clearings and open areas: Creed's, no. 4139. Forma FLAVESCENS Farwell. Local: Blackwater River, no. 4140.

ASCLEPIAS LANCEOLATA Walt., var. **paupercula** (Michx.), comb. nov. *A. paupercula* Michx. Fl. Bor.-Am. i. 108 (1803).

Assuming that Walter's *Asclepias lanceolata* is the plant with the median leaves LANCEOLATE (Walter's types are so fragmentary that the lower and middle portions of large plants are rarely preserved), the plant of Princess Anne and Norfolk Counties is chiefly var. *paupercula*, which has all the leaves very narrowly elongate-linear ("foliis longissime linearibus"—*Michx.*). We collected the lanceolate-leaved *A. lanceolata* in the brackish marsh of Back Bay, east of Morse Point in Currituck Co., North Carolina (no. 4142). Typical *A. lanceolata* extends north to New Jersey and south to Florida. Most specimens before me do not specify the habitat. One from Miami, Florida (*Garber*) is from "Everglades," one from near Elizabeth City, North Carolina (*Biltmore Herb.*, no. 1415^c) is said to be from "Wet pine barrens;" Wiegand & Manning's no. 2596 is from "River swamp" west of Leechville, North Carolina, which is on the estuary of Pungo River; our collection (see above) is from border of salt marsh; and Stone thus summarized the situation in New Jersey: "Though said in the books to be a plant of 'wet pine barrens' it is, so far as New Jersey is concerned, strictly confined to the edge of the salt marshes, where they join the upland" (Stone, Pl. So. N. J. 650 (1911)). May not the difference in habitat be largely associated with the breadth of leaf?

Our three collections of var. *paupercula* are all from acid peat: swales back of the dunes, Rifle Range, south of Rudy Inlet, Princess Anne Co., no. 4141; wet peaty clearings in woods of *Pinus serotina*, south of Grassfield, Norfolk Co., no. 4143; boggy swale by Northwest River, Northwest, *F. G. & L.*, no. 4691 (transitional). There is an old specimen of it in the Gray Herbarium from Norfolk (*J. D. Dana*). As represented in the Gray Herbarium, var. *paupercula* reaches its northern limit in southeastern Virginia; we have it from South Carolina and Georgia ("moist pine-barrens," Sumter Co., *Harper*, no. 1041), with many sheets from Florida, thence to southeastern Texas. Only a few specimens from Florida show indication of habitat and those from Mississippi, Louisiana and Texas give no such data. The Florida specimens which give clues to habitat are from Lake Co., near the geographic center of the state; from "swaley woods," Waldo (in the interior); "around ponds," Myers; "pond-margin," Chipley; "cypress swamp," Fort Myers; "swampy pine barrens," near Jacksonville. It is reasonably clear, then, that typical *A. lanceolata* prefers brackish to saline habitats, var. *paupercula* those which are acid.

A. VERTICILLATA L. Local: dry, mixed woods, Little Neck, no. 4144.

DICHONDRA REPENS Forst., var. CAROLINIENSIS (Michx.) Choisy. Frequent in grasslands: open clay at border of woods, east of Little Neck, no. 4146.

CONVOLVULUS SEPIUM L., var. **Catesbeianus** (Pursh), comb. nov. *Calystegia Catesbeiana* Pursh, Fl. Am. Sept. ii. 729 (1814). VIRGINIA: thickets and woods, Dam Neck, Princess Anne Co., no. 4147.

Var. *Catesbeianus* is the coastal variety (Cape Cod to Florida) with narrowly oblong to lanceolate, long-acuminate, sagittate leaves. It may be pubescent or glabrate and sometimes quite glabrous. Its very narrow and long-acuminate leaves at once distinguish it from var. *pubescens* (Gray) Fern. and from var. *americanus* Sims (the common American plant with glabrous stems and leaves and roseate flowers).

CUSCUTA POLYGONORUM Engelm. On *Cassia*, border of pines, near Princess Anne Courthouse, *F. & G.*, no. 2879.

C. CORYLI Englem. On various herbs, damp woods, Virginia Beach, no. 4149.

HELIOTROPIUM CURASSAVICUM L. Brackish places: Wachapreague, no. 4151; Kempsville, *F. & G.*, no. 2880.

LIPPIA NODIFLORA (L.) Michx. Brackish to fresh sands and ditches by Back Bay, northern end of Knott's Island, no. 4154.

SCUTELLARIA OVALIFOLIA Pers. Dry, mixed woods, seen several times: Little Neck, Princess Anne Co., no. 4160.

Primarily a species (*S. pilosa* Michx., not Hill) of the richer interior, on Little Neck, Great Neck and neighboring areas of rich woodland forming one of an assemblage of isolated piedmont species.

PYCNANTHEMUM INCANUM Michx., var. **Loomisii** (Nutt.), comb. nov. *P. Loomisii* Nutt. in Journ. Acad. Sci. Nat. Philad. vii. 100 (1834). VIRGINIA: Emporia, Greenville Co., *Tidestrom*, no. 6887; border of wet woods near Great Bridge, Norfolk Co., no. 4162.

Var. *Loomisii* is the southern extreme of *Pycnanthemum incanum* with the pubescence of branches and bracts reduced to a mere white-pruinose or white-puberulent coat, whereas typical *P. incanum* has the branches and, more or less, the bracts short-villous or pilose. Var. *Loomisii* has the pubescence of *P. albescens* Torr. & Gray and closely resembles that species but its calyx-lobes are sharp and setose, those of *P. albescens* blunt and without setae. Var. *Loomisii* is in the Gray Herbarium from New Jersey, Delaware, Virginia, North and South Carolina, Georgia and Alabama.

PHYSALIS PUBESCENS L. Infrequent in dry, sandy woods: Knott's Island, no. 4167; Sand Bridge, no. 4168.

Tentatively placed here; the entire group needs intelligent checking with the types.

PETUNIA PARVIFLORA Juss. Brackish sand, upper border of salt marsh, Wachapreague, Accomac Co., no. 4169.

Apparently indigenous, possibly adventive; an extension northward of the natural range, from Florida.

MIMULUS ALATUS Ait. Occasional in swampy woods: Munden, no. 4186.

LIMOSELLA SUBULATA Ives. Wet sand of dune-hollows, south of False Cape, Princess Anne Co., no. 4180.

Apparently the first recorded station south of New Jersey, southeastern Pennsylvania and the head of Chesapeake Bay in Maryland. The station is so close to the North Carolina line that search will doubtless extend the species into the "southern flora."

BACOPA MONNIERIA (L.) Wettst., var. **cuneifolia** (Michx.), comb. nov. (PLATE 401, FIGS. 1–4 and 7). *Moniera cuneifolia* Michx. Fl. Bor.-Am. ii. 22 (1803). VIRGINIA: damp sand and clay back of the ponds, Dam Neck, Princess Anne Co., no. 4183; wet sand of dune-hollows, south of False Cape, Princess Anne Co., no. 4184 (prostrate and repent); inundated swales back of the dunes, south of False Cape, no. 4185 (erect or sub-erect, up to 3 dm. high).

Typical *Bacopa Monnieria*[1] of pantropical range is smaller (FIGS. 5

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[1] I am spelling the specific name *Monnieria*, not *monnieri*, since the evidence indicates that the latter spelling, though originally used by Linnaeus, was a typographic or orthographic error. As a specific name it started in one of the Linnean Dissertations as LYSIMACHIA (*monnieri*), Cent. II. Pl. 9 (1756). These dissertations were edited, slightly revised and reprinted in Amoenitates Academicae. Centuria II, Plantarum was no. lxiii in Amoen. Acad. iv. pp. 297–332, and there the plant under discussion appeared as GRATIOLA (*monnieria*), with some alterations in the

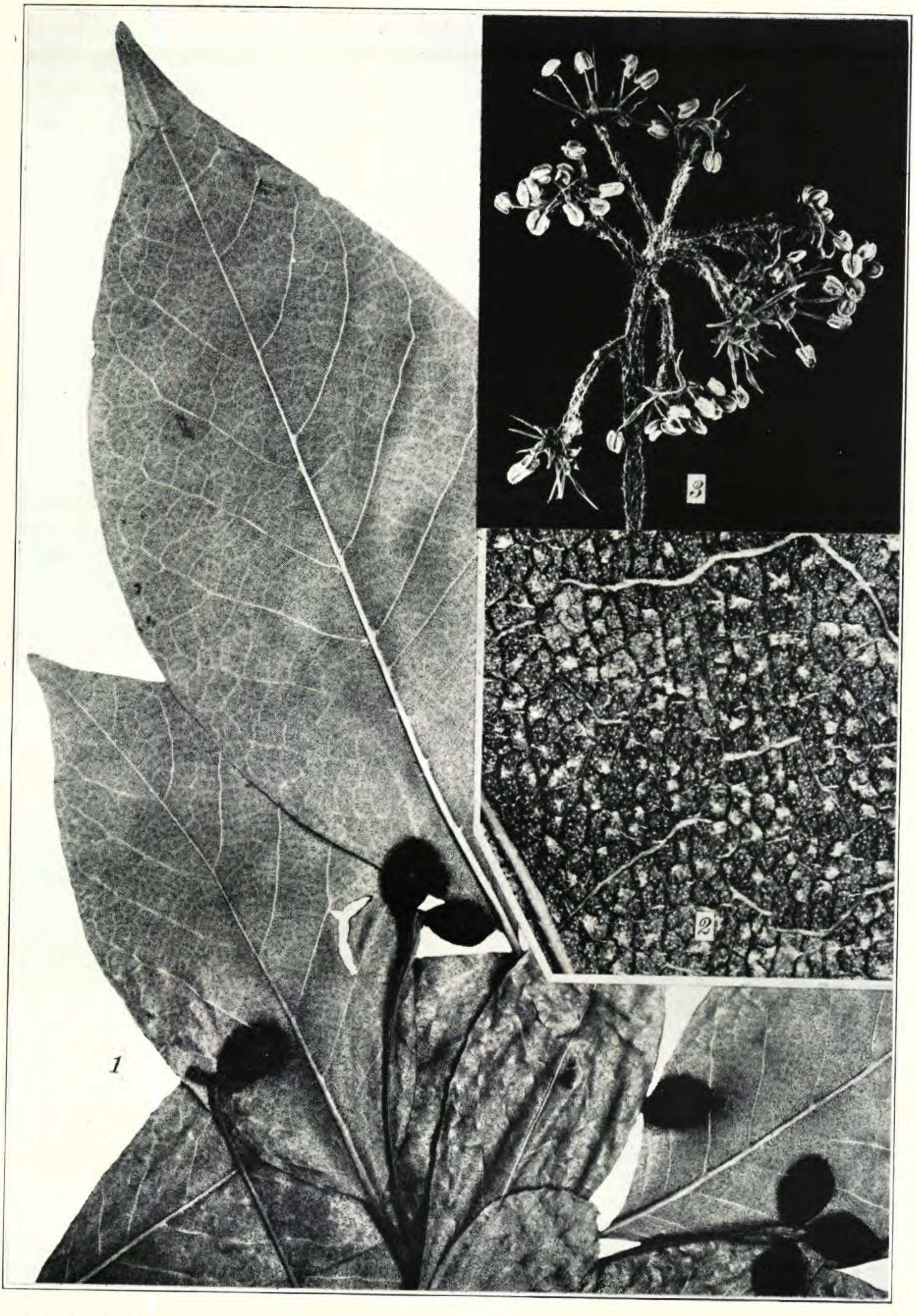

Photo. E. C. Ogden

Nyssa sylvatica, var. caroliniana: fig. 1, fruiting branch, × 1; fig. 2, papillate lower surface of leaf, × 10; fig. 3, staminate inflorescence, × 3.

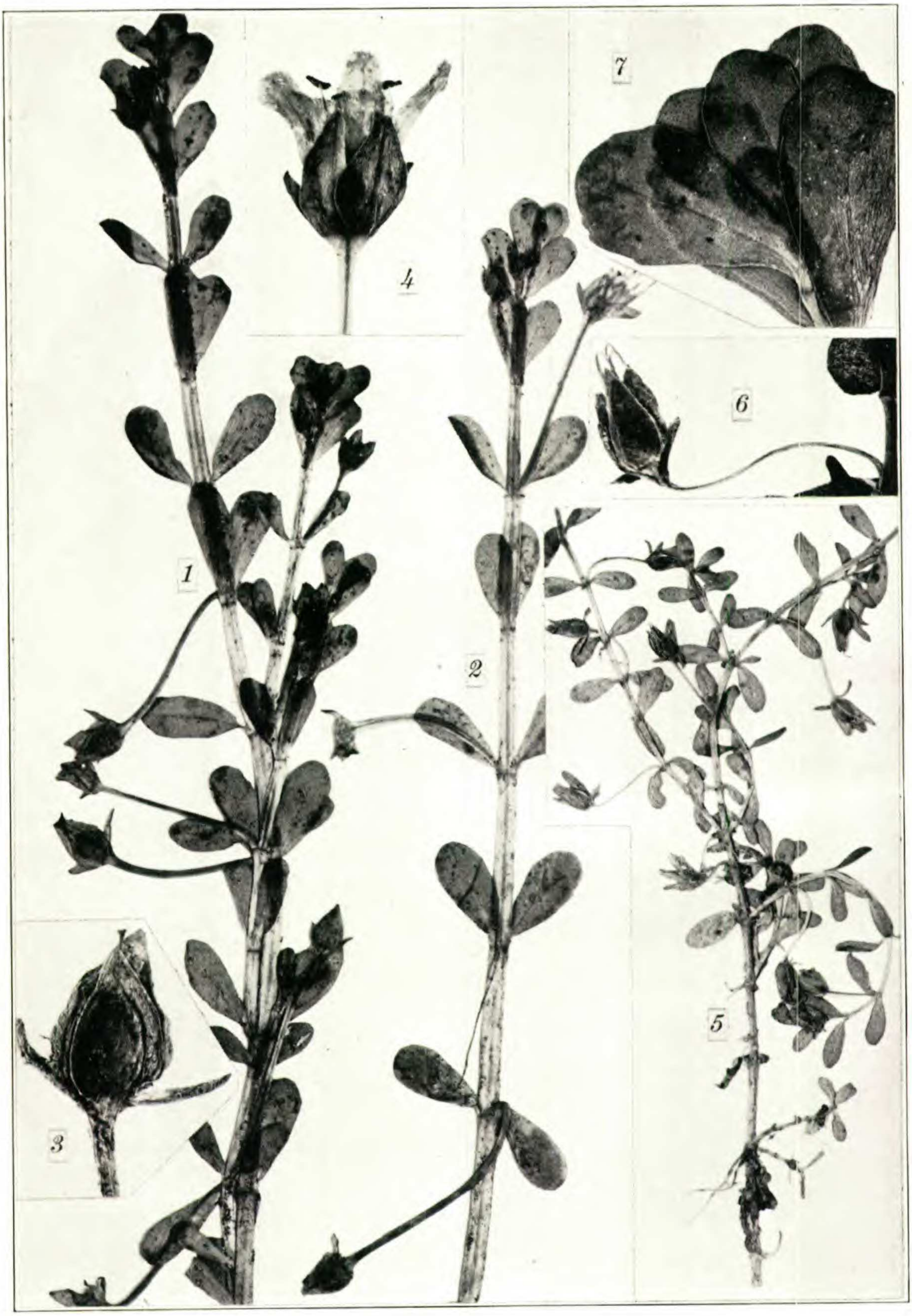

Photo. E. C. Ogden.

Bacopa Monnieria, var. cuneifolia: figs. 1 and 2, summits of erect plants, × 1; figs. 3 and 4, flowers, × 3; fig. 7, terminal leaves, × 3.
B. Monnieria: fig. 5, plant, × 1; fig. 6, fruit.

and 6), forming close carpets, the larger sepals lanceolate to lance-ovate and 1.5–2.5 mm. wide. Var. *cuneifolia,* originally from South Carolina, is typical on the coast from Georgia to southeastern Virginia, also Bermuda, and locally in the West Indies, extending thence west to Texas; it also occurs in Hawaii. It is the coarsest extreme of the species, the larger sepals ovate and 3–5 mm. broad.

It seems to me wiser to retain *Bacopa* Aublet (a *nomen conservandum*) for *Moniera* P. Br. or *Herpestis* Gaertn. f. in the inclusive sense of Bentham, Gray, Wettstein, Chodat, Edwall, Standley and others, rather than to follow Pennell in recognizing the sections and subsections as "genera." *Bacopa Monnieria* belongs to Bentham's (and Gray's) *Herpestis* § *Bramia,* to Wettstein's *Bacopa* § *Bramia.* Treated by Pennell[1] as a genus, with the floral characters already well known to Bentham, Gray and Wettstein and evaluated by them as sectional only, *Bramia* is further defined by Pennell with minor vegetative characters which are certainly not generically diagnostic: "Extensively repent" (clearly not in FIGS. 1 and 2); "Stem glabrous" (surely not a character of profound phylogenetic importance); "leaves spatulate-oblong, with one evident longitudinal nerve" (but deep in the tissue of the fleshy—halophytic—leaf there may be additional nerves), "Sepals acute or acutish, much exceeding the acute capsule" as opposed to "Sepals obtuse, scarcely longer than the rounded capsule" in *Ranapalus* or *Bacopa rotundifolia* (Michx.) Wettst. *Bacopa Monnieria* var. *cuneifolia,* included by Pennell under *Bramia* with "Sepals acute or acutish" may have them decidedly obtuse, as in FIGS. 3 and 4. *Bramia* and *Ranapalus* come in Pennell's treatment under a division including "Leaves . . . very entire," as opposed to "Leaves . . . crenate." If *entire* is an adjective which may have varying

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citations. Subsequently, in Species Plantarum, ed. 2, i. 24 (1762), it appeared as *G. Monnieria,* and this spelling and capitalization were maintained by Linnaeus in Species Plantarum, ed. 3 (1764) and in his Systema Naturae, ed. 13, ii. 61 (1770). The same spelling (*Monnieria*) was maintained by Murray, Willdenow and other editors of the Linnean works. In Syst. Nat. ed. 10, ii. 851 (1758–59) it appeared as *G. Monnieri. A.;* and this spelling reappeared in ed. 11 (1760); it seems to to have been omitted from ed. 12, but in ed. 13, as already noted, it was *G. Monnieria.* Richter, in his monumental Codex Botanicus Linnaeanus, maintained *G. Monnieria* and specially designated the spelling *Monnieri* as a typographical error ("Gr. Monnieri, *ex err. typ.*"). It should be clear that, although bungling the name (which had been a generic name of Patrick Browne), Linnaeus, in his more mature and careful work (Syst. ed. 10 being in many ways carelessly edited) settled upon *Monnieria* as the preferred spelling; and since his later editors and commentators also adopted this spelling and looked upon *monnieri* and *Monnieri* as typographic errors, it is better so to consider them. I am indebted to Dr. Barnhart for his kindness in sending me transcripts from the original Dissertation, Cent. II. Plantarum.

[1] Pennell, *Scrophulariaceae of the Southeastern United States,* Contrib. N. Y. Bot. Gard. no. 221, Proc. Acad. Nat. Sci. Phila. lxxi. 228, 229 (1920).

degrees, "very" entire is an unfortunate description of leaves which may often be like those shown in FIG. 7 (from *Harper*, no. 1826, specially designated in the Gray Herbarium by Pennell as *Bramia*).[1]

BACOPA ACUMINATA (Walt.) Robinson. Occasional in depressions and damp sands: Rosemont, no. 4181; Rifle Range, no. 4182.

GRATIOLA PILOSA Michx. Frequent in depressions, damp sands and swales: Rosemont, no. 4173; Rifle Range, nos. 4174, 4175; False Cape, no. 4172.

UTRICULARIA GEMINISCAPA Benj. Shallow pools in pinelands, Cape Henry, no. 4187.

U. SUBULATA L. Damp sands and peats, Princess Anne Co.: Cape Henry, no. 4188, also *F. & G.*, no. 4502.

PHRYMA LEPTOSTACHYA L., var. **confertifolia,** var. nov. (TAB. 402, FIG. 1), internodiis plerumque abbreviatis 0.4–1.5 cm. longis valde cinereo-pilosis; foliis subgriseis subtus puberulis apice vix prolongatis dentibus marginalibus simplicibus crenatis brevibus.—VIRGINIA: dry, mixed woods, Little Neck, Princess Anne Co., August 8 and 9, 1924, *Fernald & Long*, no. 4197 (TYPE in Gray Herb.); rich, deciduous woods, east of Little Creek, Princess Anne Co., July 31, 1934, no. 4196.

Typical *Phryma Leptostachya* has the internodes elongate, the pairs of leaves standing distinctly apart, the stems less pubescent, the leaves (FIG. 2) bright-green and only sparingly pubescent, their tips sharply acuminate or prolonged, and their usually double marginal teeth much prolonged. Var. *confertifolia*, on account of the shortening of the internodes, gives the appearance of having the bluntish or merely acute gray-green leaves subverticillate. No typical *P. Leptostachya* was seen on the coastal plain of Virginia.

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[1] Restoring the material of *Bacopa* in the Gray Herbarium to that genus, I find it necessary to make the following combinations:

BACOPA ACUMINATA (Walt.) Rob., var. **microphylla** (Raf.), comb. nov. *Ambulia rigida* Raf., var. *microphylla* Raf. Aut. Bot. 43 (1840). *Mecardonia acuminata brevifolia* Pennell, Proc. Acad. Nat. Sci. Phila. lxxi. 237 (1920). *M. acuminata microphylla* (Raf.) Pennell, Torreya, xxii. 79 (1922).

B. ACUMINATA (Walt.) Rob., var. **peninsularis** (Pennell), comb. nov. *Mecardonia acuminata peninsularis* Pennell, Proc. Acad. Nat. Sci. Phila. lxxi. 237 (1920).

In 1930 Pennell marked the material in the Gray Herbarium *Mecardonia acuminata peninsularis;* in 1931 he assigned it to the genus *Pagesia*, but he left typical *Bacopa acuminata* and var. *microphylla* in the genus *Mecardonia*.

B. PROCUMBENS (Mill.) Greenm., var. **peduncularis** (Benth.), comb. nov. *Herpestis peduncularis* Benth. in Hook. Comp. Bot. Mag. ii. 56 (1836). *H. chamaedryoides*, var. *peduncularis* (Benth.) Gray, Syn. Fl. N. Am. ii^{1}. 280 (1878). *Mecardonia peduncularis* (Benth.) Small, Fl. Se. U. S. 1065, 1338 (1903).

B. PROCUMBENS (Mill.) Greenm., var. **tenuis** (Small), comb. nov. *Mecardonia tenuis* Small, Fl. Se. U. S. 1065, 1338 (1903).

Although Pennell maintained this as a species he characterized *Mecardonia tenuis* as "so close to *M. procumbens* and to *M. peduncularis* (Benth.) Small of Texas that the actual relationship of these species should be more fully investigated in the field" (Proc. Acad. Nat. Sci. Phila. lxxi. 238 (1920)). Asa Gray better understood it (Syn. Fl.) when he said of it under *Herpestis procumbens*, var. *peduncularis:* "A similar form, but with diffuse or procumbent stems (*H. peduncularis*, Chapm. Fl. 291), is from Key West, Florida."

GALIUM OBTUSUM Big., var. **filifolium** (Wiegand), comb. nov. *G. tinctorium filifolium* Wiegand in Bull. Torr. Bot. Cl. xxiv. 397 (1897). *G. filifolium* (Wiegand) Small, Man. 1208 (1933).—Frequent in damp woods about Virginia Beach, no. 4202, also *F. G. & L.*, no. 4704.

In his very helpful study[1] of *Galium trifidum and its North American Allies*, Wiegand clearly differentiated several plants which had previously been confused under *G. trifidum;* but, although he said of *G. trifidum*, as well as of some of the other names involved, "It is necessary first of all to determine just what plant this name represents," he contented himself with a discussion of the interpretations of various post-Linnean authors, without recording any effort to see exactly what Linnaeus had before him. In the cases of *G. trifidum* L. Sp. Pl. 105 (1753) and *G. tinctorium* L. l. c. 106 (1753) the types are perfectly clear; both were collected by Kalm, the first in "Canada," the second in "North America." Happily, Wiegand's deduction regarding the identity of *G. trifidum* was correct; a beautiful photograph of the Kalm sheet (the type) sent me from the Linnean Herbarium by Mr. S. Savage is a most characteristic specimen of the plant, with long arcuate peduncles, now properly passing as *G. trifidum.*

In the other case, however, that of *Galium tinctorium*, I am unable to follow Wiegand's reasoning when he writes of it, "From the description given by Linnaeus one can scarcely tell which plant is meant," for to me the Linnean diagnosis of Kalm's specimen (from Eastern America, probably Crown Point, New York, at the foot of Lake Champlain) is definite: "foliis linearibus: caulinis senis; ramorum quaternis, caule flaccido, pedunculis subbifloris, fructibus glabris." In spite of the clear statement by Linnaeus that the linear cauline leaves were in 6's, those of the branches in 4's, and the stems flaccid, Wiegand applied the name *G. tinctorium* to *G. obtusum* Bigelow and defined it as "rather stiff, . . . branches . . . strict, . . stem glabrous or nearly so; leaves commonly in 4's, . . . corolla white, large (2–3½ mm. diam.), 4-parted"; while he called the small-flowered and weaker plant with primary leaves in 6's *G. Claytoni* Michx., well characterized by Wiegand: "stem slender . . . [with] diffuse branches . . . ; leaves . . . commonly in 5's or 6's, . . . flowers in clusters of 2's or 3's, . . . corolla minute, white, 3-parted."

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[1] Wiegand, Bull. Torr. Bot. Cl. xxiv. 389–403 (1897).

As a synonym of his *Galium Claytoni* Wiegand cited "*G. tinctorium* Bigelow, Fl. Bost. ed. 2, 54. 1824." Having learned to have a keen respect for the precision of Jacob Bigelow, who with John Torrey early shared distinction as an accurate American phytographer, I have turned to Bigelow's accounts. After giving a clear English version of the Linnean diagnosis of *G. tinctorium* Bigelow added his own:

> A weak, branching plant, rough with reflexed prickles. Leaves linear-lanceolate, obtuse, whorled, the larger ones in sixes, smaller ones in fours. Peduncles very small, supporting minute white flowers.

Bigelow's account was so like the Linnean diagnosis of *Galium tinctorium* that it is not easy to see why his plant should be treated as identical with *G. Claytoni* Michx., if the Kalm plant (type of *G. tinctorium*) is not also *G. Claytoni*. That Bigelow clearly understood the two species, subsequently again differentiated by Wiegand, is evident. His *Galium obtusum* was thus defined:

> *G. caule laevi, procumbente; foliis quaternis, oblanceolatis, obtusis, margine nervoque asprellis; fructu laevi.*
>
> Stem smooth, procumbent; leaves in fours, oblanceolate, obtuse, rough on the edge and midrib; fruit smooth.
>
> Stem slender, diffuse, much branched, quadrangular, entirely smooth. Leaves universally in fours, linear-lanceolate, very obtuse, a little rough at the midrib and margin. Peduncles slender, three flowered. Petals acute, white. Fruit globular, smooth.—On the banks of Muddy brook, Roxbury.—July.—Perennial.

Further indicating his correct understanding of the two species, Bigelow added the comparative note: "It is a larger and more open plant than G. tinctorium." Every one who knows the type-region of *G. obtusum* and the abundant specimens from there in the local herbaria will agree with Wiegand that the plant which, in 1897, he called *G. tinctorium* is unquestionably *G. obtusum* Bigel.

Since American botanists have been following Wiegand in treating the partly 6-leaved flaccid *G. tinctorium* of Linnaeus as a stiffer plant with "leaves commonly in 4's," it seemed important to settle the exact identity of Kalm's material which is the type of *G. tinctorium.* Fortunately, the sheet in the Linnean Herbarium is well preserved (obviously not much studied in the past!) and a portion of the photograph of it, which Mr. Savage sends, is here reproduced, life-size, as PLATE 403, FIG. 1. Beside it, for comparison, is a portion of a plant (FIG. 2) farther advanced but still with some ascending flowers (the specimen from Conquest, New York, *Wiegand*, no. 7172) of the plant which Wiegand has removed from his own *G. tinctorium* and called *G. Claytoni.* Further to clarify the situation, FIG. 3 is a flowering frag-

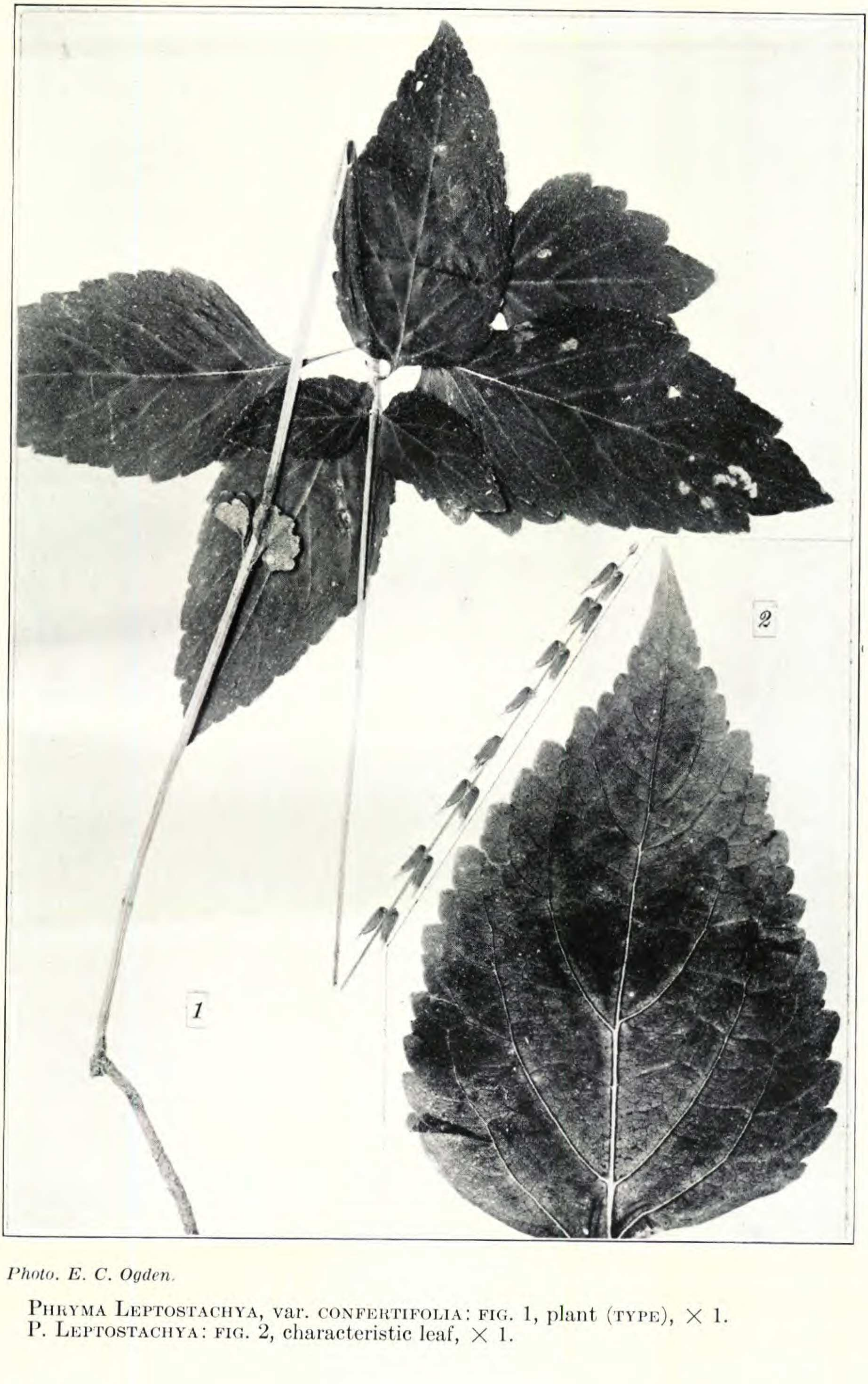

Photo. E. C. Ogden.

PHRYMA LEPTOSTACHYA, var. CONFERTIFOLIA: FIG. 1, plant (TYPE), × 1.
P. LEPTOSTACHYA: FIG. 2, characteristic leaf, × 1.

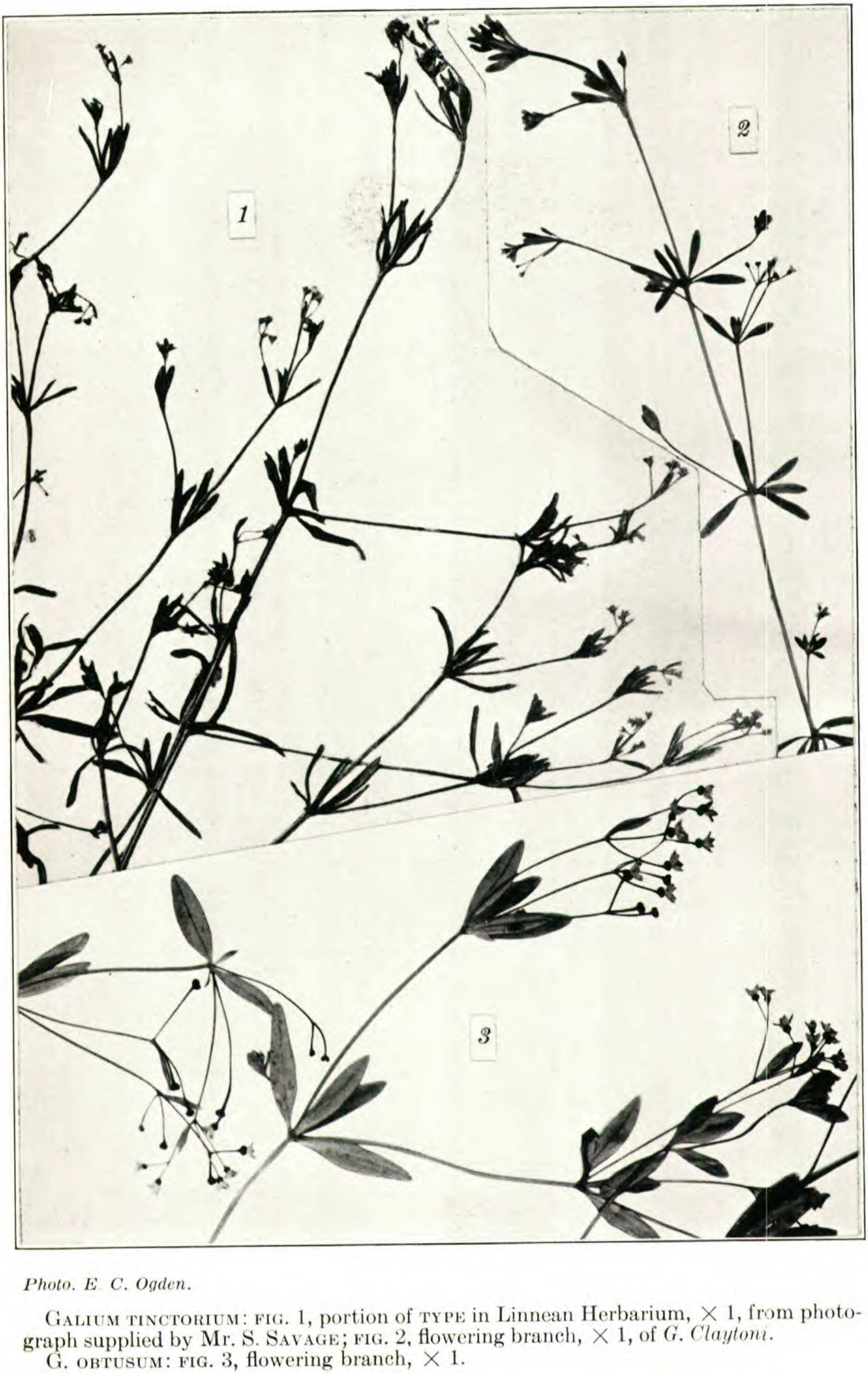

Photo. E. C. Ogden.

Galium tinctorium: fig. 1, portion of type in Linnean Herbarium, × 1, from photograph supplied by Mr. S. Savage; fig. 2, flowering branch, × 1, of *G. Claytoni*.
G. obtusum: fig. 3, flowering branch, × 1.